

I-25 Improvements Through the Colorado Springs Urbanized Area Environmental Assessment

**Appendix 1, Transportation Resources
Interstate 25 Corridor-El Paso County, Colorado
Mode Feasibility Alternatives Analysis
Traffic Analysis Technical Memorandum**

Traffic Analysis Technical Memorandum

I-25 Improvements Through the Colorado Springs Urbanized Area Project

CDOT Project No. IM 0252-316

Project Control No. 12210

Colorado Department of Transportation

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1.0 Project Description (Proposed Action)

The Proposed Action would widen Interstate 25 from South Academy Boulevard (Exit 135) to State Highway 105 (Exit 161, Monument), a distance of approximately 26 miles. Within these limits, a six-lane cross-section (three through-lanes in each direction) would be built south of the U.S. Highway 24 Bypass to South Academy and north of Briargate to SH 105. Additionally, for the 12-mile central portion from the US 24 Bypass (Exit 139) to Briargate Parkway (Exit 151), the Proposed Action consists of an eight-lane cross section (four through-lanes in each direction).

In the eight-lane cross-section, the inside (left-most) lane in each direction would be open to general traffic during off-peak hours; during morning and evening peak hours, this lane would be reserved for use by carpools and buses only. To accommodate this flexible use, the high-occupancy-vehicle (HOV) lane would not be barrier-separated from the general-purpose lanes, but would be demarcated by appropriate signage and striping.

The non-barrier HOV treatment also allows for decommissioning of the lanes back to general-purpose operation in the event that the lanes do not result in adequate peak-period usage to justify HOV operations. This will depend in part upon public willingness to fund expanded transit operations that would use the HOV lanes. The HOV lanes are projected to be marginally successful without transit system expansion, but could become solidly successful if used by buses on hypothetical future routes (currently unfunded). Express bus service between Colorado Springs and Monument began in 2002 as a 3-year “demonstration project.”

In conjunction with the additional laneage, the Proposed Action includes interchange reconstruction at several locations. Figures 1, 2, 3, 4, 5, and 6 depict the proposed configuration for these interchanges that would undergo major reconstruction:

- Exit 141 – Cimarron (U.S. Highway 24)
- Exit 142 – Bijou Street
- Exit 145 – Fillmore
- Exit 147/148 – North Nevada Avenue and Rockrimmon Boulevard (consolidated)
- Exit 156 – North Gate Road, plus freeway-to-freeway ramps for Powers Boulevard
- Exit 158 – Baptist Road

Additionally, minor geometric changes will be made at Exit 146, Garden of the Gods Road. The existing southbound-only ramps at Exit 147 A (Corporate Centre Drive) will be closed, with access via a local street connection to the reconfigured Nevada/Rockrimmon interchange. In conjunction with freeway widening on U.S. Air Force Academy property, the Ackerman Overlook will be relocated to a safer location.

The I-25 corridor already has traffic surveillance cameras, variable message signs, and an incident management system. In the Proposed Action, the design of freeway on ramps will accommodate future implementation of ramp metering.



FIGURE 1
Cimarron Street Interchange

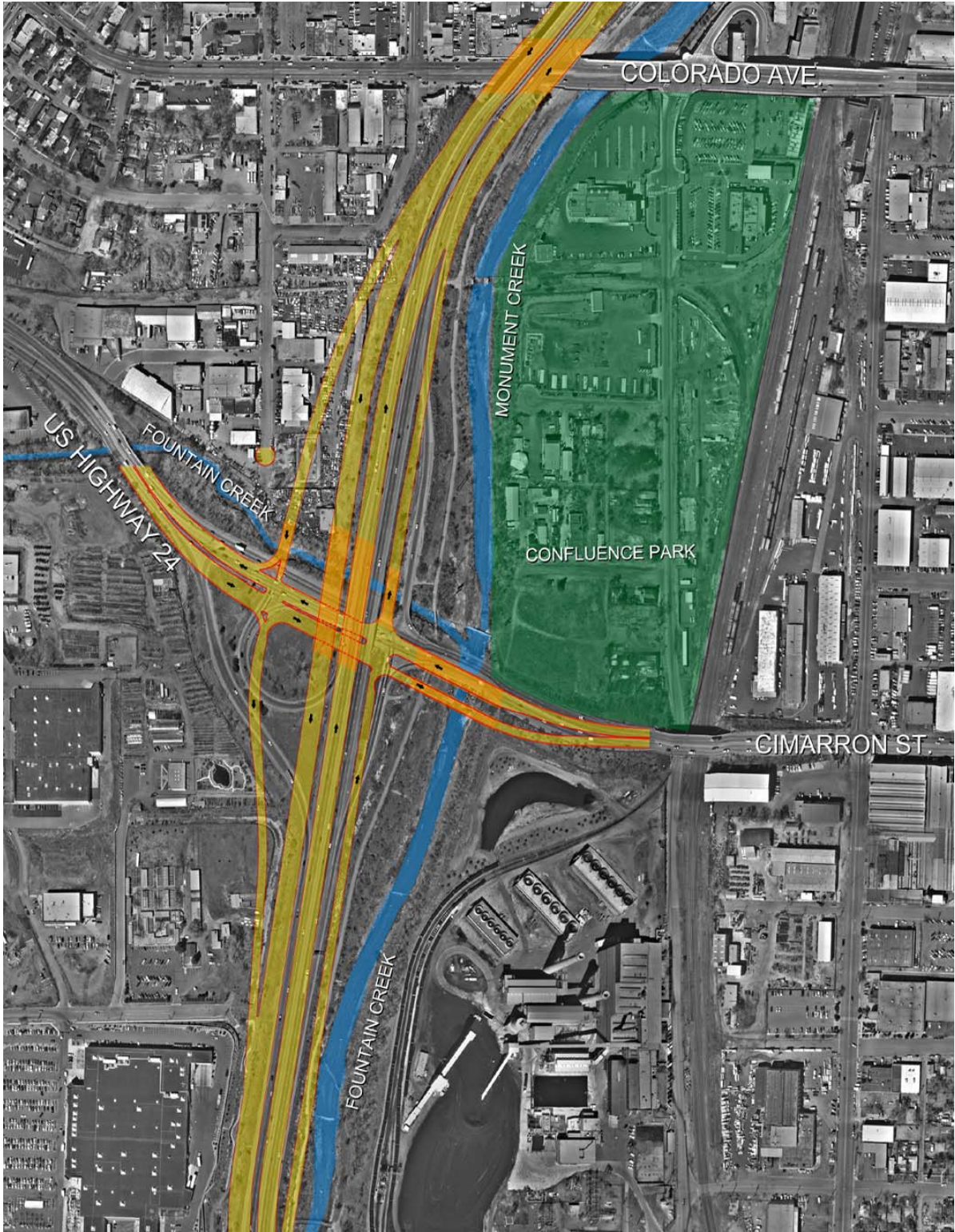


FIGURE 2
Bijou Street Interchange



FIGURE 3
Fillmore Street Interchange

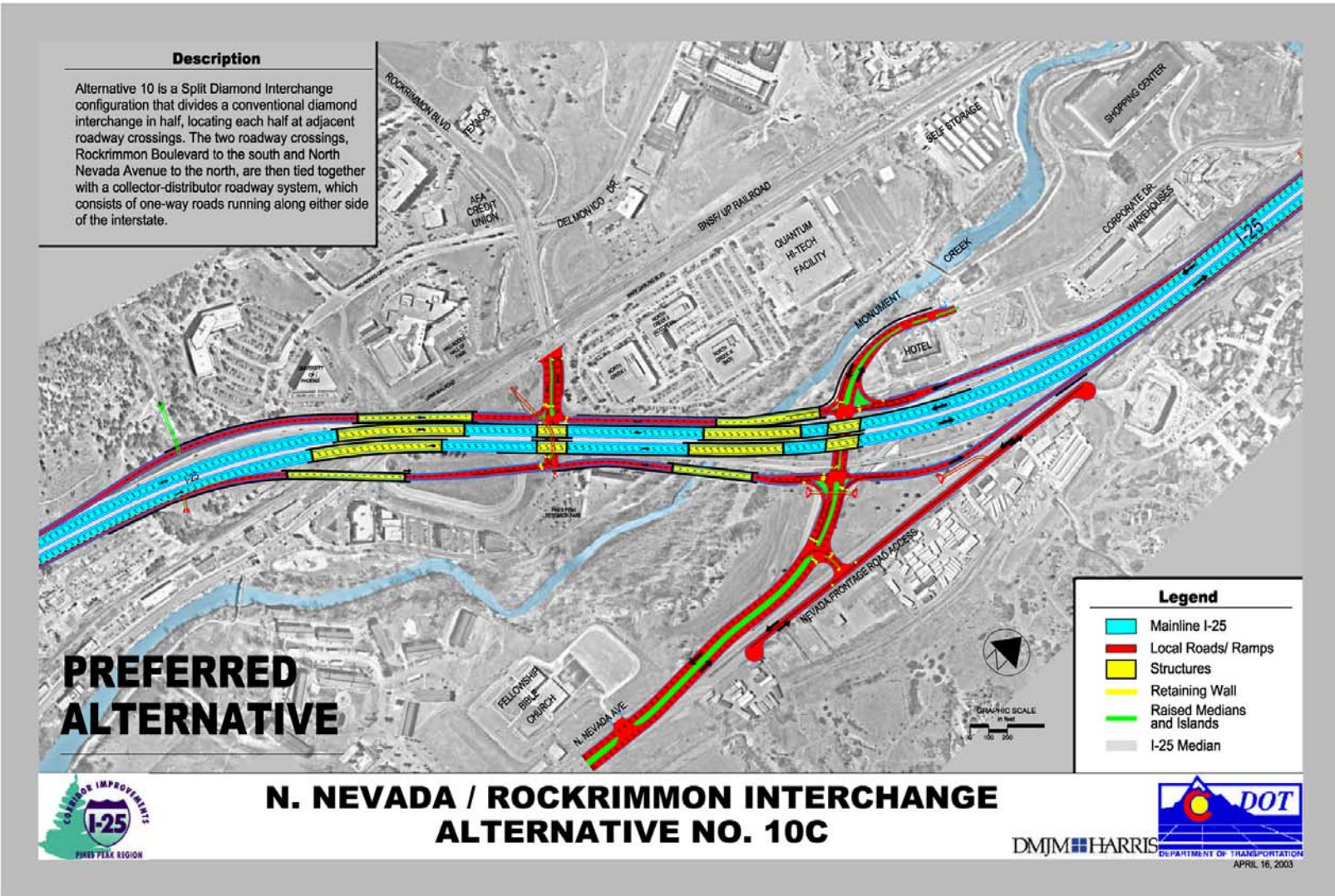


FIGURE 4
Nevada Avenue/Rockrimmon Boulevard Interchange



NORTHGATE-BAPTIST INTERCHANGE IMPROVEMENTS

NORTHGATE BOULEVARD INTERCHANGE PROPOSED ACTION

Six alternatives were considered for the Northgate Boulevard interchange. Of these, one has been carried forward for further evaluation in the I-25 Corridor Environmental Assessment. The proposed action consists of an interchange system with a diamond interchange at Northgate Boulevard and a fully directional interchange at Powers Boulevard.



FIGURE 5
North Gate Boulevard Interchange



NORTHGATE-BAPTIST INTERCHANGE IMPROVEMENTS

BAPTIST ROAD INTERCHANGE PROPOSED ACTION

Five alternatives were considered for the Baptist Road interchange. Of these, one has been carried forward for further evaluation in the I-25 Corridor Environmental Assessment. The proposed action includes a standard diamond interchange with improved ramps and relocated frontage roads and business access.

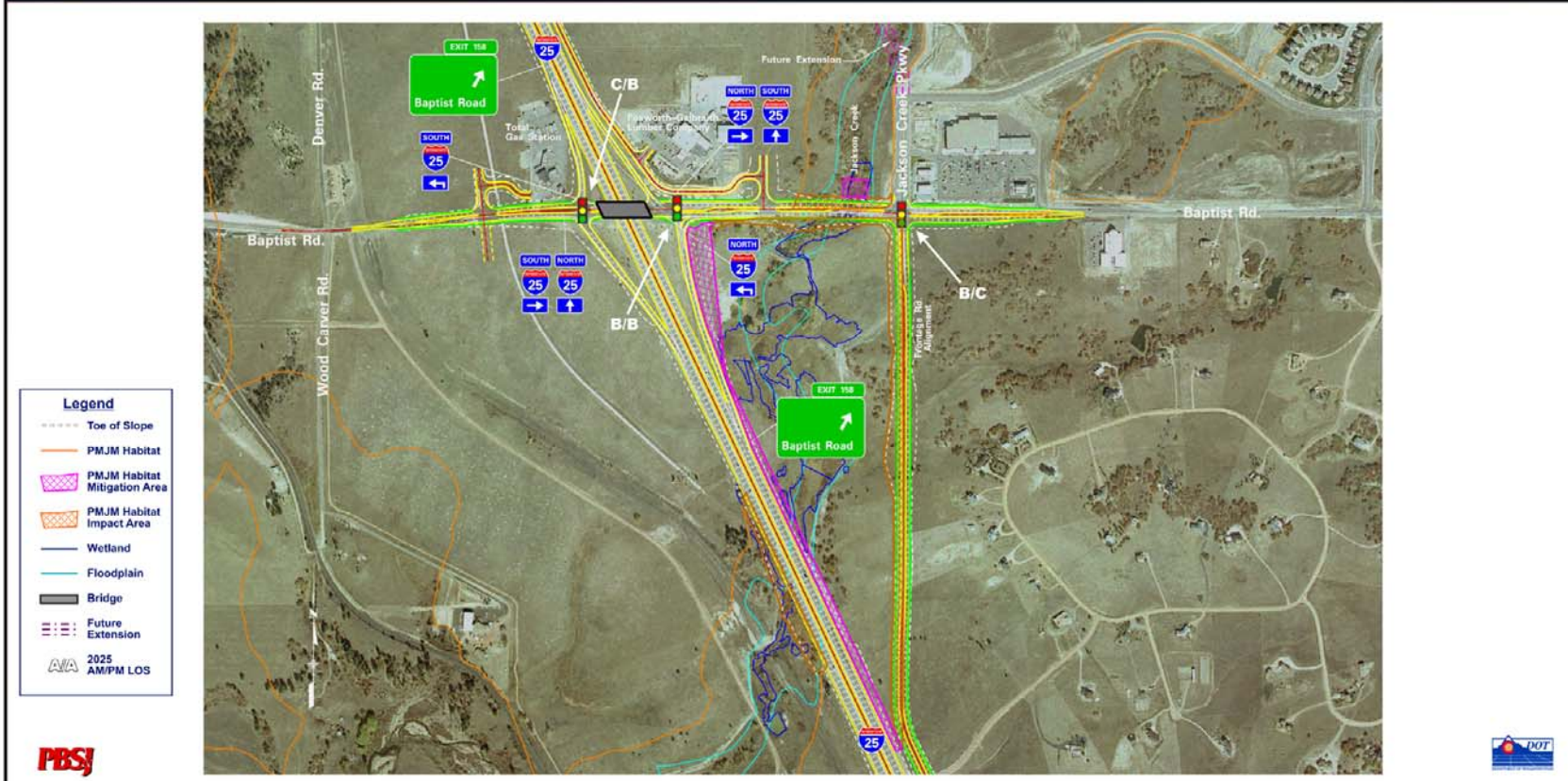


FIGURE 6
Baptist Road Interchange

2.0 Existing Conditions

Interstate 25 was built as part of the National Defense Highway System and today is part of the Strategic Highway System designated for armed forces in case of an emergency. I-25 is the only major north-south corridor in the State of Colorado and, in the Colorado Springs area, meets the only major east-west highway in the region – US Highway 24. US 24 (Exit 141) provides access to Pikes Peak and other mountain communities. At Exit 139, the US 24 Bypass route serves the Colorado Springs airport, two Air Force bases, and Colorado’s eastern plains.

The posted speed in the I-25 mainline corridor changes from 75 mph to 65 mph to 55 mph as the corridor transitions from a rural highway north and south of Colorado Springs to an urban freeway within the city limits. The existing facility is in rolling terrain and is a four-lane, divided highway with 19 interchanges throughout the 15-mile corridor. There are several exceptions to the four-lane section within the corridor where one additional lane is added between ramp junctions within the urban sections. In areas near the downtown core, the corridor has substandard mainline horizontal and vertical geometry, and substandard ramp junctions, and does not have the capacity to handle the existing traffic demand.

I-25 through Colorado Springs is currently at capacity during the weekday morning and afternoon peak hours. The *I-25 Mode Feasibility Alternatives Analysis* indicated that without additional capacity, I-25 congestion that now lasts 4 hours a day and extends for 9 miles would last 10 hours daily and extend for 26 miles.

2.1 I-25 Interchanges

The interchanges in the corridor can be divided into three categories for the purpose of discussion in this report: Capacity Interchanges, Safety Interchanges, and Incidental Interchanges.

Capacity Interchanges include those interchanges proposed for full reconstruction to increase traffic capacity for vehicles accessing Interstate 25 at the interchange. Each of the Capacity Interchanges have undergone a complete concept analysis and selection process to select a Proposed Action, and have included all associated environmental impacts within the Environmental Assessment that is currently in process for the I-25 corridor. The Capacity Interchanges include:

- Exit 141 – Cimarron (US 24) Interchange
- Exit 142 – Bijou Street Interchange
- Exit 145 – Fillmore Street Interchange
- Exit 147/148 – North Nevada/Rockrimmon Interchange (consolidated)
- Exit 156 – North Gate Boulevard Interchange
- Exit 158 – Baptist Road Interchange

The **Safety Interchanges** include those interchanges that have been reconstructed recently, or are currently under construction, solely for safety improvements and not to increase traffic capacity for vehicles accessing I-25 at the interchange. Each of the Safety Interchanges investigated environmental impacts independently and was cleared for

construction independent of the Environmental Assessment for the I-25 corridor. Because these interchanges were, or are, being constructed between the design year for existing conditions (2000) and the design year for the No-Action Alternative (2025), their configurations (within this report) may change between the analysis of existing conditions and the No-Action Alternative. The Safety Interchanges include:

- Exit 138 – Circle Drive/Lake Avenue
- Exit 140 – Nevada Avenue/Tejon Street
- Exit 143 – Uintah Street
- Exit 144 – Fontanero Street
- Exit 149 – Woodmen Road
- Exit 161 – Monument/State Highway 105

The **Incidental Interchanges** include those existing interchanges along the I-25 corridor that were constructed years prior to the existing design year (2000). Improvements to these interchanges for the Proposed Action “build condition” (year 2025) will include ramp gore realignments to fit the widened typical section proposed for I-25. Improvements will also include ramp gore reconstruction to provide two-lane exit ramps (one auxiliary lane drop and one either/or) where necessary for lane balance and consistency along the I-25 corridor. The Incidental Interchanges include:

- Exit 135 – South Academy
- Exit 139 – Martin Luther King US 24 Bypass
- Exit 146 – Garden of the Gods
- Exit 150 – North Academy
- Exit 151 – Briargate Parkway
- Exit 152 – Ackerman Overlook (southbound only)
- Exit 153 – Interquest Parkway

2.2 Cross Roads

The local roadway network accessing the I-25 corridor is typical of an urban growth area with non-linear neighborhood collector/arterial systems surrounding an older downtown grid system. The roadway network connecting to I-25 is also at or near capacity within the urban sections. Continued growth north and east of Colorado Springs will continue to put pressure on the existing local roadway network.

Colorado Springs was founded in what is now the central downtown area. As the population increased, the growth did not occur evenly around the city. Physical constraints have contributed to the city’s uneven development. With the mountains to the west and Fort Carson to the south, the city has grown north and east toward Black Forest, the U.S. Air Force Academy, and Monument. Traffic on I-25 is generally oriented toward the downtown core in the mornings and away from the downtown core in the evening. However, there are other major employment centers that are not in the downtown area. For example, the region’s largest employer, Fort Carson, and a major employment corridor along Garden of the Gods Road is north of downtown.

Much of the commuter population travels westward in the morning on local arterials roadways to get to I-25. There are only a few major east-west arterials in Colorado Springs, and they are predominantly in the northern section. Woodmen Road and I-25 is a major interchange that is heavily used because Woodmen Road links fast-growing eastern areas to I-25. Garden of the Gods Road/ Austin Bluffs Parkway is also a major east-west arterial that connects to I-25, serving Holland Park, Pinon Valley, Pinecliff, and communities north of Palmer Park.

North-south routes are widely used to travel from northern Colorado Springs to the downtown areas. Academy Boulevard, which was the original interstate in Colorado Springs, travels through the center of town and is often congested, particularly on the weekends. Nevada Avenue, Union Boulevard, and Powers Boulevard are also widely used north-south routes. Powers Boulevard is the easternmost north-south route and will be extended to I-25 to serve traffic to and from eastern Colorado Springs, the Colorado Springs Municipal Airport, Peterson Air Force Base, and the City of Fountain.

Current on ramp volumes show heavy arterial usage in the morning at southbound Woodmen Road and southbound Garden of the Gods Road. The largest off ramp volumes in the morning are at the southbound Rockrimmon/Nevada interchange. This exit is also a designated business loop to reach downtown as well as a major north-south route through the city. The Martin Luther King/US 24 Bypass and Cimarron Street/US 24 are the only major east-west streets south of downtown. West of I-25, Cimarron Street (also called the Midland Expressway) is particularly congested eastbound in the morning and westbound in the evening, serving commuters not only from western Colorado Springs and Manitou Springs but also residential communities near Woodland Park in the mountains.

In general, traffic is heavier north of the city than south of the city. Table 1 – I-25 Mainline Peak-Hour Traffic Flow Through Colorado Springs shows the minimum and maximum existing mainline volumes along I-25 during the morning and evening peak hours. It can be seen that the lowest traffic volumes occur at the northern and southern edges of the study area, far from downtown Colorado Springs. The heaviest volumes occur within the city’s central area.

TABLE 1
I-25 Mainline Peak-Hour Traffic Flow Through Colorado Springs

	AM		PM	
	SB	NB	SB	NB
Min	1,780 – Monument	1,055 – Monument	1,390 – Monument	1,265 – South Academy
Max	4,925 – Woodmen	4,400 – Fillmore	4,145 – Tejon	4,335 – Woodmen

Traffic trends for the corridor show a steady increase of morning traffic volume southbound approaching downtown, with a significant drop in volume near the downtown exits. Congestion along the interstate and east-west cross streets is most common in the northern part of the city and occurs most predominantly near Woodmen Road and I-25.

2.3 Existing Volumes, Capacity Analysis, and LOS

Mainline I-25 and Interchange Volumes

Average daily traffic in the corridor for the Existing condition (year 2000) is shown in Figures 7A and 7B – Existing I-25 Mainline Average Daily Traffic Volumes. Figure 7A includes interchanges in the northern half of the study area, from Monument (Exit 161) to North Nevada (Exit 148), inclusive. Figure 7B includes interchanges in the southern half of the study area, from Rockrimmon Boulevard (Exit 147) to South Academy Boulevard (Exit 135), inclusive.

Based on the I-25 mainline volumes in Figures 7A and 7B, morning and evening peak period volumes were calculated for each roadway segment to determine Level of Service (LOS). Traffic level of service is defined differently and calculated differently for various types of roadway operations, including mainline lanes, weave sections, and intersections, as will be noted at appropriate locations throughout this memorandum. A basic explanation of LOS for freeway mainline operations is provided below.

LEVEL OF SERVICE: A REPORT CARD FOR HIGHWAY OPERATION
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<p>Traffic engineers characterize highway operations in terms of the Level of Service (LOS) that motorists experience. In the nationally used <i>Highway Capacity Manual</i>, LOS is defined with a letter grading system (A through F) similar to traditional student grades used by educators:</p>
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<p>LOS A describes free-flow conditions. A motorist's speed and maneuverability are unimpeded by other traffic on the road.</p>
--

<p>LOS B represents reasonably free flow, with free-flow speeds prevailing and maneuverability only slightly restricted.</p>

<p>LOS C still provides speeds at or near free flow, but maneuverability is noticeably restricted.</p>

<p>LOS D is the level at which speeds decline slightly due to traffic density, and room to maneuver is more noticeably restricted.</p>

<p>LOS E provides reduced speeds and offers little room to maneuver because vehicles are closely spaced. The roadway is at or near its capacity.</p>

<p>LOS F represents a breakdown in traffic flow in which traffic demand exceeds the roadway's capacity.</p>
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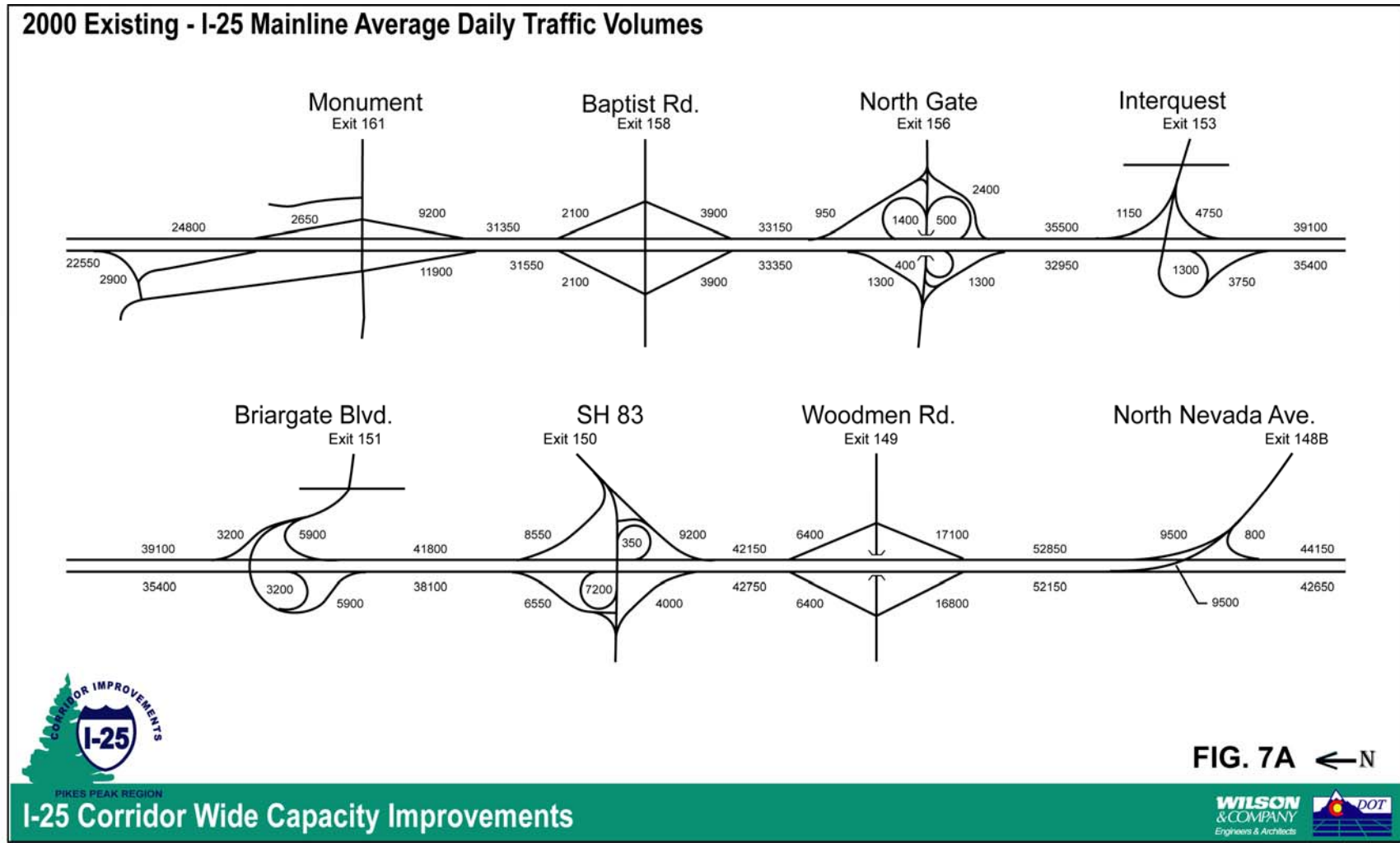


FIGURE 7A
Year 2000 Existing – I-25 Mainline Average Daily Traffic Volumes – Northern Half of Study Area

2000 Existing - I-25 Mainline Average Daily Traffic Volumes

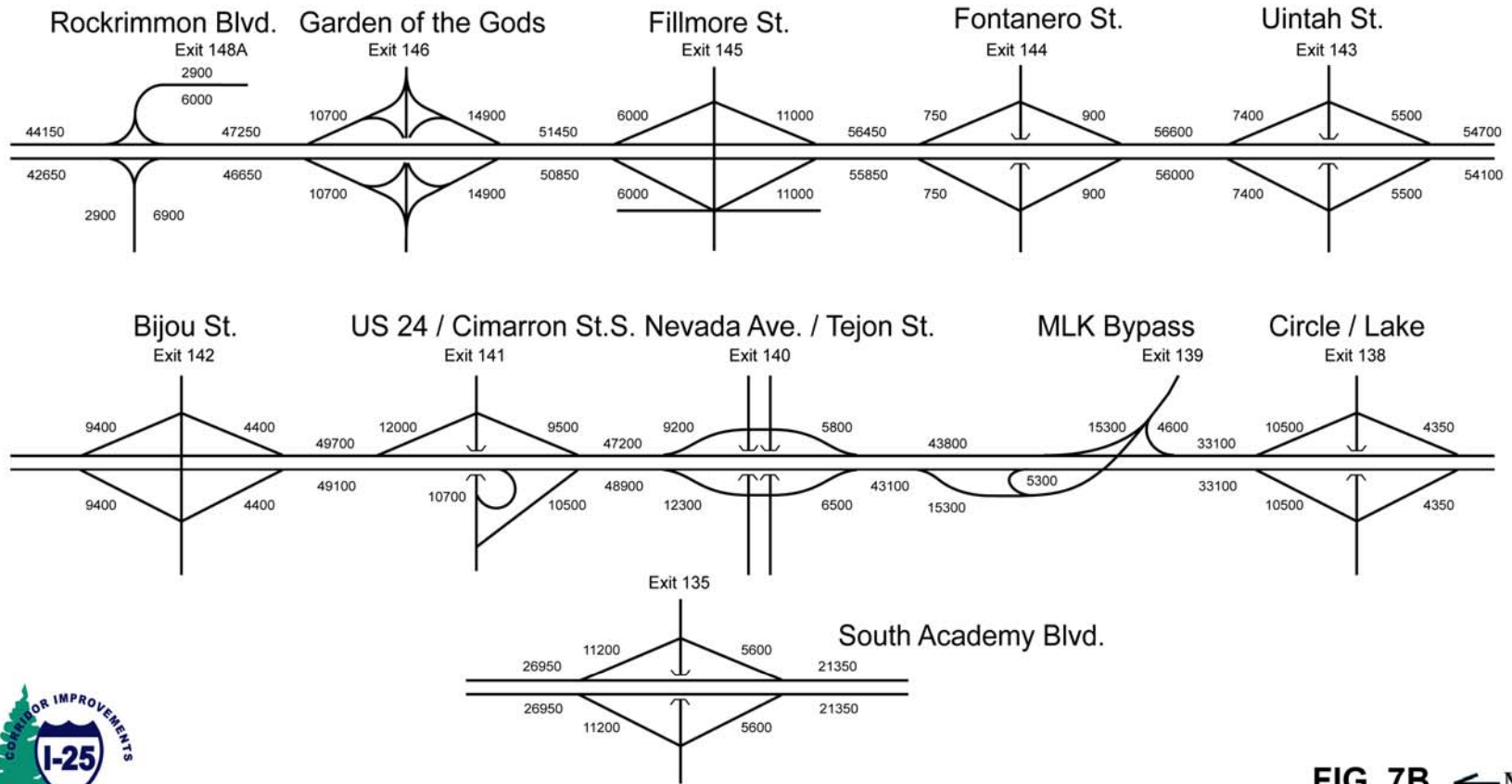


FIG. 7B ← N



I-25 Corridor Wide Capacity Improvements



FIGURE 7B
Year 2000 Existing - I-25 Mainline Average Daily Traffic Volumes - Southern Half of Study Area

LOS Analysis Mainline I-25 and Interchanges

The Highway Capacity Software (HCS) level of service (LOS) for the I-25 mainline and interchange Existing conditions is shown in Table 2 – Analysis Results for Existing Conditions on Interstate 25. The following observations are made from Table 2:

- Northbound I-25

Thirteen basic freeway sections, six weaving, and 28 ramp (merge or diverge) sections were analyzed

- AM Peak Hour

- Of the 13 basic freeway sections, LOS E or F would be experienced in 31 percent of the sections. Correspondingly, 54 percent of the sections would experience LOS C or D, while 15 percent of the sections would experience LOS A or B.
- Of the six weaving sections, 50 percent of the sections were estimated to experience LOS C or D, while the remaining 50 percent of the sections operate at LOS A or B. No sections were estimated to operate at LOS E or F.
- Of the 28 ramp junctions analyzed, 18 percent of the junctions are estimated to operate at LOS E or F. Forty-six percent of the ramp junctions operate at LOS C or D, while the remaining 36 percent were estimated to operate at LOS A or B.

- PM Peak Hour

- Of the 13 basic freeway sections analyzed, 23 percent of the sections are estimated to operate at LOS E or F. The remaining 77 percent of the sections are estimated to operate at LOS C or D. None of the sections are estimated to operate at LOS A or B.
- Of the six weaving sections, 33 percent are estimated to operate at LOS C or D, while 50 percent are estimated to operate at LOS A or B. Seventeen percent of the weaving sections were estimated to operate at LOS E or F.
- Of the 28 ramp junctions analyzed, 7 percent are estimated to operate at LOS E or F, 61 percent at LOS C or D, and the remaining 32 percent at LOS A or B.

- Southbound I-25

Fifteen basic freeway sections, four weaving, and 34 ramp (merge or diverge) sections were analyzed

- AM Peak Hour

- Of the 15 basic freeway sections, LOS E or F would be experienced in 47 percent of the sections. Correspondingly, 47 percent of the sections would experience LOS C or D, while 6 percent of the sections experienced LOS A or B.
- Of the four weaving sections, 50 percent of the sections would experience LOS C or D, while 25 percent of sections would operate at LOS A or B. Twenty-five percent were estimated to operate LOS E or F.

- Of the 34 ramp junctions analyzed, 38 percent of the junctions are estimated to operate at LOS E or F. Fifty percent of the ramp junctions operate at LOS C or D, while the remaining 12 percent are estimated to operate at LOS A or B.
- PM Peak Hour
- Of the 15 basic freeway sections analyzed, 33 percent of the sections are estimated to operate at LOS E or F, while 53 percent of the sections are estimated to operate at LOS C or D. Fourteen percent of the sections are estimated to operate at LOS A or B.
 - Of the four weaving sections, none are estimated to operate at LOS E or F, while 50 percent are estimated to operate at LOS A or B. The other 50 percent of the weaving sections are estimated to operate at LOS C or D.
 - Of the 34 ramp junctions analyzed, 21 percent are estimated to operate at LOS E or F, 62 percent at LOS C or D, and the remaining 17 percent at LOS A or B.

TABLE 2
Analysis Results for Existing (Year 2000) Conditions on Interstate 25

I-25 Year 2000 Traffic Conditions						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
Northbound I-25						
AM Peak Hour						
135	S. Academy	138	S. Circle	On Ramp	32.3	D
				Basic Freeway	42.7	E
				Off Ramp	29.7	D
138	S. Circle	139	MLK Bypass	Weave	16.0	B
139	MLK Bypass	140	S. Nevada/Tejon	On Ramp	*	F
				Basic Freeway	29.0	D
				Off Ramp	23.9	B
140	S. Nevada/Tejon	141	Cimarron	On Ramp	*	F
				Basic Freeway	32.2	D
				Off Ramp	*	F
141	Cimarron	142	Bijou	Weave	49.8	F
142	Bijou	143	Uintah	Weave	29.8	C
143	Uintah	144	Fontanero	Weave	19.2	B
144	Fontanero	145	Fillmore	On Ramp	23.0	C
				Basic Freeway	30.9	D
				Off Ramp	27.7	C
145	Fillmore	146	Garden of the Gods	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	25.9	C
146	Garden of the Gods	148	Rockrimmon	On Ramp	27.2	C
				Basic Freeway	*	F
				Off Ramp		E
148	Rockrimmon	148	N. Nevada	Weave		D
148	N. Nevada	149	Woodmen	On Ramp		B
				Basic Freeway	27.2	D
				Off Ramp	0.4	A

TABLE 2
Analysis Results for Existing (Year 2000) Conditions on Interstate 25

I-25 Year 2000 Traffic Conditions						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
149	Woodmen	150	N. Academy	On Ramp	29.8	D
				Basic Freeway	*	F
				Off Ramp	21.1	C
150	N. Academy	151	Briargate	On Loop	19.1	B
				On Ramp	28.8	D
				Basic Freeway	21.9	C
				Off Ramp	24.4	C
151	Briargate	153	Interquest	On Ramp	24.8	C
				Basic Freeway	23.7	C
				Off Ramp	21.8	C
153	Interquest	156	North Gate	On Ramp	16.3	B
				Basic Freeway	18.2	C
				Off Ramp	21.6	C
156	North Gate	158	Baptist	Weave	11.4	B
				On Ramp	18.5	B
				Basic Freeway	14.9	B
				Off Ramp	17.7	B
158	Baptist	161	Monument	On Ramp	16.1	B
				Basic Freeway	13.9	B
				Off Ramp	6.3	A
161	Monument	163	County Line Rd.	On Ramp	8.1	A
PM Peak Hour						
135	S. Academy	138	S. Circle	On Ramp	16.7	B
				Basic Freeway	21.3	C
				Off Ramp	12.7	B
138	S. Circle	139	MLK US 24 Bypass	Weave	13.4	B
139	MLK US 24 Bypass	140	S. Nevada/Tejon	On Ramp	30.9	D
				Basic Freeway	18.5	C
				Off Ramp	19.3	B
140	S. Nevada/Tejon	141	Cimarron	On Ramp	36.1	E
				Basic Freeway	27.2	C
				Off Ramp	22.5	C
141	Cimarron	142	Bijou	Weave	58.0	F
142	Bijou	143	Uintah	Weave	26.8	C
143	Uintah	144	Fontanero	Weave	15.6	B
144	Fontanero	145	Fillmore	On Ramp	18.2	B
				Basic Freeway	25.3	C
				Off Ramp	20.9	C
145	Fillmore	146	Garden of the Gods	On Ramp	26.1	C
				Basic Freeway	*	F
				Off Ramp	19.2	B
146	Garden of the Gods	148	Rockrimmon	On Ramp	23.5	C
				Basic Freeway	*	F
				Off Ramp		E
148	Rockrimmon	148	N. Nevada	Weave		F

TABLE 2
Analysis Results for Existing (Year 2000) Conditions on Interstate 25

I-25 Year 2000 Traffic Conditions						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
148	N. Nevada	149	Woodmen	On Ramp		C
				Basic Freeway	32.0	D
				Off Ramp	0.0 [#]	A
149	Woodmen	150	N. Academy	On Ramp	29.9	D
				Basic Freeway	*	F
				Off Ramp	20.6	C
150	N. Academy	151	Briargate	On Loop	18.9	B
				On Ramp	29.6	D
				Basic Freeway	22.7	C
				Off Ramp	27.2	C
151	Briargate	153	Interquest	On Ramp	25.4	C
				Basic Freeway	25.3	C
				Off Ramp	26.6	C
153	Interquest	156	North Gate	On Ramp	20.8	C
				Basic Freeway	22.4	C
				Off Ramp	26.6	C
156	North Gate	158	Baptist	Weave	14.5	B
				On Ramp	27.5	C
				Basic Freeway	23.4	C
				Off Ramp	27.7	C
158	Baptist	161	Monument	On Ramp	22.4	C
				Basic Freeway	20.3	C
				Off Ramp	8.8	A
161	Monument	163	County Line Rd.	On Ramp	9.7	A
Southbound I-25						
AM Peak Hour						
County Line		161	Monument	Off Ramp	10.1	B
161	Monument	158	Baptist	On Ramp	21.6	C
				Basic Freeway	22.3	C
				Off Ramp	26.4	C
				On Ramp	32.5	D
158	Baptist	156	North Gate	Basic Freeway	30.1	D
				Off Ramp	33.6	D
				Off Loop	32.2	D
156	North Gate	153	Interquest	On Ramp	34.2	D
				Basic Freeway	32.5	D
				Off Ramp	*	F
				On Ramp	*	F
153	Interquest	152	Ackerman Overlook	Basic Freeway	37.8	E
				Off Ramp	*	F
				Weave	25.0	C
152	Ackerman Overlook	151	Briargate	On Ramp	*(34.9)	F
151	Briargate	150	N. Academy	Basic Freeway	30.1	D
				Off Ramp	27.7	C

TABLE 2
Analysis Results for Existing (Year 2000) Conditions on Interstate 25

I-25 Year 2000 Traffic Conditions						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit		To Exit				
150	N. Academy	149	Woodmen	On-Loop	28.6	D
				On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	*	F
149	Woodmen	148	N. Nevada	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp		E
				Off Ramp (Left)		E
148	N. Nevada	148	Rockrimmon	On Ramp	*	A
				Basic Freeway		F
				Off Ramp		A
148	Rockrimmon	146	Garden of the Gods	On Ramp		E
				Basic Freeway	*	F
				Off Ramp	25.9	C
146	Garden of the Gods	145	Fillmore	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	*	F
145	Fillmore	144	Fontanero	Basic Freeway	*	F
				Off Ramp	24.0	C
144	Fontanero	143	Uintah	Weave	18.4	B
143	Uintah	142	Bijou	Weave	38.4	E
142	Bijou	141	Cimarron	On Ramp	23.5	C
				Basic Freeway	27.9	D
				Off Ramp	34.4	D
141	Cimarron	140	S. Nevada/Tejon	On Ramp	*	F
				Basic Freeway	31.0	D
				Off Ramp	25.4	C
140	S. Nevada/Tejon	139	MLK Bypass	Weave	26.2	C
139	MLK US 24 Bypass	138	S. Circle	On Ramp	25.5	C
				Basic Freeway	14.7	B
				Off Ramp	0.0 [#]	A
138	S. Circle	135	S. Academy	On Ramp	30.0	D
				Basic Freeway	32.8	D
				Off Ramp	22.6	C
135	S. Academy	132	State Highway 16	On Ramp	25.8	C
PM Peak Hour						
163	County Line Rd.	161	Monument	Off Ramp	5.8	A
161	Monument	158	Baptist	On Ramp	16.5	B
				Basic Freeway	17.8	B
				Off Ramp	21.1	C
158	Baptist	156	North Gate	On Ramp	23.7	C
				Basic Freeway	19.9	C
				Off Ramp	23.7	C

TABLE 2
Analysis Results for Existing (Year 2000) Conditions on Interstate 25

I-25 Year 2000 Traffic Conditions						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
156	North Gate	153	Interquest	Off Loop	22.7	C
				On Ramp	25.3	C
				Basic Freeway	21.4	C
				Off Ramp	22.4	C
153	Interquest	152	Ackerman Overlook	On Ramp	27.3	C
				Basic Freeway	25.0	C
				Off Ramp	30.1	D
152	Ackerman Overlook	151	Briargate	Weave	19.6	B
151	Briargate	150	N. Academy	On Ramp	23.6	C
				Basic Freeway	21.4	C
				Off Ramp	16.0	B
150	N. Academy	149	Woodmen	On Loop	26.0	C
				On Ramp	29.4	D
				Basic Freeway	*	F
				Off Ramp	29.8	D
149	Woodmen	148	N. Nevada	On Ramp	36.6	E
				Basic Freeway	*	F
				Off Ramp		E
				Off Ramp (Left)		E
148	N. Nevada	148	Rockrimmon	On Ramp		E
				Basic Freeway		D
				Off Ramp		E
148	Rockrimmon	146	Garden of the Gods	On Ramp		E
				Basic Freeway	*	F
				Off Ramp	19.2	B
146	Garden of the Gods	145	Fillmore	On Ramp	28.3	D
				Basic Freeway	*	F
				Off Ramp	30.6	D
145	Fillmore	144	Fontanero	Basic Freeway	*	F
				Off Ramp	22.1	C
144	Fontanero	143	Uintah	Weave	17.1	B
143	Uintah	142	Bijou	Weave	28.5	D
142	Bijou	141	Cimarron	On Ramp	24.7	C
				Basic Freeway	26.0	D
				Off Ramp	34.6	D
141	Cimarron	140	S. Nevada/Tejon	On Ramp	*	F
				Basic Freeway	31.2	D
				Off Ramp	25.6	C
140	S. Nevada/Tejon	139	MLK US 24 Bypass	Weave	34.3	D
139	MLK US 24 Bypass	138	S. Circle	On Ramp	30.3	D
				Basic Freeway	17.4	B
				Off Ramp	0.0 [#]	A

TABLE 2
Analysis Results for Existing (Year 2000) Conditions on Interstate 25

I-25 Year 2000 Traffic Conditions						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit		To Exit				
138	S. Circle	135	S. Academy	On Ramp	26.6	C
				Basic Freeway	29.1	D
				Off Ramp	17.3	B
135	S. Academy	132	SH 16	On Ramp	23.3	C

* Overall results are not computed when the LOS is an F
HCS computed negative density value changed to 0.0 pc/mi/ln

These observations are summarized in Table 3 – Observations from the LOS and Capacity Analysis for Existing Conditions on Interstate 25.

TABLE 3
Observations from the LOS and Capacity Analysis For Existing Conditions on Interstate 25

Direction	Peak Period	Freeway Facility	Total Analyzed	Percentage		
				LOS E or F	LOS C or D	LOS A or B
Northbound	AM Peak	Basic Freeway	13	30.8	53.8	15.4
		Weaving	6	0.0	50.0	50.0
		Ramp Junction	28	17.9	46.4	35.7
	PM Peak	Basic Freeway	13	23.1	76.9	0.0
		Weaving	6	16.7	33.3	50
		Ramp Junction	28	7.1	60.7	32.2
Southbound	AM Peak	Basic Freeway	15	46.7	46.7	6.6
		Weaving	4	25.0	50.0	25.0
		Ramp Junction	34	38.2	50.0	11.8
	PM Peak	Basic Freeway	15	33.3	53.4	13.3
		Weaving	4	0	50.0	50.0
		Ramp Junction	34	20.6	61.8	17.6

LOS Analysis Cross Road Signalized Intersections

The 2000 HCM was used to evaluate the LOS for each signalized intersection at the ramp terminals from I-25. The HCS evaluation assumed current timings and configurations that existed in 2000. The HCS LOS analysis for the cross road ramp terminals is shown in Table 4 – HCS LOS Analysis of the Interchange Ramp Terminals for Year 2000 Traffic.

TABLE 4

HCS LOS Analysis of the Interchange Ramp Terminals for Year 2000 Traffic

Interchange Intersection	Peak Hour	Signal Location	Original Cycle Length	Existing LOS
161- Monument	am	West	90	C
		East	95	C
		Center	93	C
	pm	West	90	C
		East	95	D
		Center	93	C
153- Interquest Pkwy	am	w/ 83	80	C
	pm	w/ 83	80	B
151- Briargate Pkwy	am	w/ 83	105	C
	pm	w/ 83	105	C
150- N. Academy	am	East	69	A
		West	69	A
	pm	East	138	A
		West	138	A
149- Woodmen	am	East	124	F
		West	124	F
	pm	East	124	F
		West	124	F
146- Garden of the Gods	am	Center	137	D
	pm	Center	137	C
144- Fontanero	am	East	n/a :90	--
		West	n/a :90	--
	pm	East	n/a :90	--
		West	n/a :90	--
143- Uintah	am	East	114	C
		West	114	C
	pm	East	114	B
		West	114	B
140- S. Nevada/Tejon	am	Tejon North	--	A
		Tejon South	115	C
		Nevada North	115	C
		Nevada South	115	F
	pm	Tejon North	--	A
		Tejon South	115	C
		Nevada North	115	B
		Nevada South	115	F
138- S. Circle/Lake	am	East	125	B
		West	125	C
	pm	East	125	B
		West	125	C
135- S. Academy	am	West	100	B
		East	100	B
	pm	West	100	C
		East	100	B

The data presented in the above table are summarized below.

- The **Monument/State Highway 105** ramp terminals operate at LOS C in the AM peak hour and operate at LOS C/D in the PM peak hour.
- The **Interquest Parkway** ramps intersect State Highway 83 about $\frac{3}{4}$ -mile east of I-25. The intersection operates at LOS C in the AM peak hour and LOS B during the PM peak hour.
- The **Briargate Parkway** ramps intersect State Highway 83 north of Colorado Springs. The intersection operates at LOS C during both peak hours.
- The **North Academy** ramp terminals currently operate well at LOS A during both the AM and PM peak hours.
- The **Woodmen Road** ramp terminals currently operate at a failing LOS. The heavy turning movements to and from the interstate and heavy through volumes cannot be accommodated by the current intersection capacity and signal operations.
- The **Garden of the Gods** interchange is a single-point urban interchange with one center signalized intersection. The intersection operates at LOS D in the AM peak hour and LOS C in the PM peak hour.
- The **Fontanero Street** ramp terminals are currently not signalized.
- The **Uintah Street** ramp terminals currently operate well at LOS C during the AM peak hour and LOS B for the PM peak hour.
- The **Nevada Avenue/Tejon Street** ramp terminals have a range of LOS from B to F. The intersections are failing at LOS F due to the through movement volumes on Nevada Street. Other ramp terminal signals are operating at LOS C or better.
- The **US 24 Bypass** does not have ramp terminals with signalized intersections. The ramps merge to the east to become a bypass highway (Fountain Road).
- The **Circle Drive/Lake Avenue** ramp terminals currently operate well during both peak periods at LOS B for the east ramp and LOS C for the west ramp.
- The **South Academy** ramp terminals currently operate well at LOS B during the AM peak hour and LOS B/C for the PM peak hour.

3.0 Methodology

For each of the interchange reconstruction projects, numerous design alternatives were considered and evaluated. These alternatives were presented for review and input at advertised public meetings. For example, 17 alternatives were considered for the Bijou/Cimarron complex, 11 alternatives were considered for Fillmore interchange reconstruction, 11 alternatives were considered involving North Nevada and Rockrimmon, six alternatives were considered at North Gate, and five alternatives were considered for the Baptist Road interchange. Traffic operations, public input and numerous other criteria (e.g., factors including right-of-way impacts, local access, environmental impacts, and cost)

were used to evaluate alternatives and select proposed alternatives. The selected alternatives were included as part of the Proposed Action. The traffic analysis methodology described below was subsequently applied for the Proposed Action on a system-wide basis.

In the methodology and results discussed below, results for the future (year 2025) “Build” condition reflect the regional traffic network (the PPACG Destination 2025 Regional Transportation Plan) including the Proposed Action. References to future “No-Build” conditions traffic conditions reflect the No-Action Alternative (i.e., all other transportation system improvements in the PPACG 2025 plan except for capacity improvements on I-25).

3.1 Capacity Analysis Methodology

The analysis corridor for this report consists of the I-25 corridor from Monument (Exit 161) to South Academy Boulevard (Exit 135). The analysis was performed using methods presented in the Highway Capacity Manual (HCM), published by the Transportation Research Board in association with the Federal Highway Administration (FHWA), 2000.

The HCM 2000 states that the analysis of a freeway includes the following segments:

- Basic Freeway: Segments of the freeway that are outside the influence area of ramps or weaving areas.
- Ramp Junctions: These could include ramp to freeway junctions or freeway to ramp junctions. Ramp to freeway junctions are merge junctions, while the freeway to ramp junctions are diverge junctions.
- Weaving: Weaving is defined as the crossing of two or more traffic streams traveling in the same general direction along a significant length of highway without the aid of traffic control devices (with the exception of guide signs). Weaving segments are formed when a merge area is closely followed by a diverge area, or when an on ramp is closely followed by an off ramp and the two are joined by an auxiliary lane.

Detailed data is required to complete the operational analysis of a freeway. The data needs for all segments of freeway analysis are listed in Table 5 – Data Needs and Analysis Values for the Operational Analysis of Freeway Segments. The HCM 2000 provides default values to use for an operational analysis if the data is not readily available. These default values are overwritten for observed values in the interstate corridor. These values are also summarized in Table 5.

A consistent approach to evaluating the interstate corridor is important in this evaluation. To be consistent, the corridor capacity analysis was conducted by Wilson & Company for the entire corridor including the capacity interchange areas. Appropriate assumptions about input data were used for the corridor across each segment of the corridor (see Table 5). The appropriate files were then forwarded to each capacity interchange consultant for review and correction if assumed values were incorrect for that section of the corridor. Changes were reviewed, approved, and documented and the analysis was repeated with the updated values for that section.

The posted speed limit through the I-25 corridor changes from 75 miles per hour north of Briargate Parkway, to 55 mph through central Colorado Springs. The posted speed limit

changes again to 65 mph south of the Martin Luther King US 24 Bypass. The HCM 2000 suggests the use of mainline free-flow speed as 75 mph for rural sections and 70 mph for urban sections. However, the FHWA requested use of 75 mph for basic freeway segments in rural areas and 60 mph in urban areas. Further, the analysis uses 70 mph free flow speed for ramp merge/diverge sections located in rural areas (north of North Academy) and 60 mph free flow speed in urban areas (between South Academy and North Academy). These free flow speeds were used in the operational analysis to be consistent with the constraints of HCM 2000 and the air quality conformity analysis conducted as a part of the I-25 Environmental Assessment.

TABLE 5
Data Needs and Default Values for the Operational Analysis of Freeway Segments

Data	HCM 2000 Default Value
1. Geometric Data	
a. Section length	Observed
b. Mainline Number of Lanes	Observed
c. Mainline average lane width	12 feet
d. Mainline lateral clearance	10 feet
e. Terrain – level, rolling or mountainous	Level, Rolling
f. Ramp number of lanes	Observed
g. Ramp acceleration lane length	Observed
h. Ramp deceleration lane length	Observed
2. Traffic Characteristics Data	
a. Mainline free-flow speed	Rural – 70, 75 mph Urban – 60 mph
b. Vehicle Occupancy (passengers per vehicle)	1.2
c. Percent trucks, busses and RV's	Rural – observed Urban – observed
d. Driver population (commuter or recreational)	Commuter Traffic
e. Ramp free flow speeds	35 mph
3. Demand Data	
a. Length of analysis period	15 minutes
b. Peak Hour Factor	Rural – 0.88 Urban – 0.92
c. Mainline (freeway) entry demand data	Observed
d. On ramp demands for each time interval	Observed
e. Off ramp demands for each time interval	Observed
f. Weaving demand on weaving segments	Observed

Source: Highway Capacity Manual, published by the Transportation Research Board, 2000. Exhibits 13-5, page 13-11, and 13-17, page 13-24.

The methodology presented in the HCM 2000 utilizes the input data to determine the density of operation of the freeway segment. Based on the density and facility type, the HCM 2000 provides a letter grade for operations. The estimated letter grade is the Level-of-Service (LOS). LOS ranges from A through F. LOS A represents free-flow operations where free-flow speeds prevail. Under these conditions, vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The effects of incidents or point breakdowns are easily absorbed at this level. LOS F represents breakdowns in vehicular flow. Such conditions generally exist with queues forming behind breakdown points as traffic incidents, points of recurring congestion, or when the flow rate exceeds the capacity of the facility.

The HCM 2000 defines three weaving configurations for performing a weaving operational analysis. They are:

- Type A: The identifying characteristic of a Type A weaving segment is that all weaving vehicles must make one lane change to complete their maneuver successfully. All of these lane changes occur across a lane line that connects from the entrance gore area directly to the exit gore area.
- Type B: All Type B weaving segments fall into the general category of major weaving segments in that such segments always have at least three entry and exit legs with multiple lanes. The Type B configuration is classified by either of the following conditions:
 - One weaving movement can be made without making any lane changes, and
 - The other weaving movement requires at most one lane change.
- Type C: Type C weaving segments are similar to those of Type B in that one or more through lanes are provided for one of the weaving movements. The distinguishing characteristic of a Type C weaving segment is that the other weaving movement requires a minimum of two lane changes for successful completion of the weaving maneuver. Thus, a Type C weaving segment is characterized by the following:
 - One weaving movement may be made without making a lane change, and
 - The other weaving movement requires two or more lane changes.

3.2 Volume Growth Trends and Forecast Analysis

Mainline growth trends are based on the Pikes Peak Area Council of Governments (PPACG) regional model and the socioeconomic input data used in the model. The PPACG model provided a base from which to start balancing the mainline corridor volumes with the extensive consultant interchange development interaction in the corridor. Many of the interchanges in the corridor have been part of an ongoing process of evaluation. These interchange evaluations were rolled into the modeling and volume-balancing effort in an effort to be consistent with ongoing projects in the corridor. The process of developing peak hour volumes was based on the Average Weekday Daily Traffic (AWDT) information developed for this EA. The steps to balancing the corridor are outlined below.

- Step 1. Reference PPACG 2025 model mainline AM and PM peak hour volumes as the basis from which to start and integrate ramp volumes from other consultants in the corridor. The model assumes improvements to I-25.
- Step 2. Use existing ramp volume data and PPACG growth rates to extrapolate additional interchange ramp volumes.
- Step 3. Evaluate planning level operations of 2025 Build condition for mainline capacity restrictions.
- Step 4. Balance ramp volumes within corridor to reflect capacity restraints.
- Step 5. Verify growth assumptions (2025 Build compared to 2000) on mainline.

- Step 6. Reference 2025 Build condition mainline and ramp volumes as basis for developing No-Build volumes.
- Step 7. Evaluate planning-level traffic operations of 2025 No-Action Alternative for mainline capacity restrictions.
- Step 8. Balance ramp volumes within corridor to reflect capacity restraints.
- Step 9. Verify growth assumptions (2025 No-Action Alternative compared to 2000) on the I-25 mainline.

Step 1 and Step 2

The PPACG AM and PM peak hour 2025 models were used as the starting point for developing the mainline and ramp volumes.

These 2025 Build condition volumes were then overlaid with the consultant ramp volumes for each interchange project.

- Baptist Road PBS&J
- North Gate Road/Powers connection PBS&J
- Rockrimmon Road/Nevada Avenue DMJM+HARRIS
- Garden of the Gods Road DMJM+HARRIS
- Fillmore Street Wilson & Company
- Bijou Street FHU
- Cimarron Street FHU
- Nevada Avenue/Tejon Avenue FHU

The mainline volumes were then balanced with the consultant ramp volumes to produce a preliminary 2025 Build condition volume map of the corridor. Existing ramp volume information from a previous analysis effort was used as a guide to developing additional 2025 Build condition ramp volumes. Growth rates from the PPACG model and other consultant interchange projects were used to produce ramp volumes to balance the corridor.

Step 3 and Step 4

A planning level capacity analysis was conducted to evaluate the ability of the facility to handle assigned traffic volumes. Volume adjustments to the Build condition were not needed.

Step 5

The balanced 2025 Build condition mainline and ramp volumes were checked against the 2000 Existing condition mainline and ramp volume to verify growth rate assumptions and look for inconsistencies with PPACG growth assumptions. PPACG growth assumptions indicate the majority of growth occurring in the north corridor. The balanced 2025 Build condition volumes reflect the growth of the north corridor in the I-25 mainline volume growth.

Step 6, Step 7, and Step 8

The 2025 No-Build condition volume map is based on the 2025 Build condition volume map developed in Steps 1-5. The 2025 No-Build condition reflects a condition of constrained capacity on the freeway system, which discourages access to the freeway with congested traffic conditions. The 2025 Build condition volumes were passed through the planning level capacity analysis again to evaluate the ability of the facility to handle assigned traffic volumes using No-Build capacity on the freeway. Adjustments were made to ramp volumes to reduce volume onto I-25 where LOS F conditions prevailed and traffic was reduced to crawl speed (density levels between 60 and 70 passenger cars per mile per lane [pcpmpl]). Traffic volumes were assumed to be diverted to parallel arterial routes where possible, accessing the highway where congestion subsides. Other trips were permanently diverted from the system where parallel routes were available.

Step 9

The balanced 2025 No-Build condition mainline and ramp volumes were checked against the 2000 Existing condition mainline and ramp volume to verify growth rate assumptions and look for inconsistencies with PPACG growth assumptions. PPACG growth assumptions indicate the majority of growth occurring in the north corridor. The balanced 2025 No-Build condition volumes reflect the growth of the north corridor in the I-25 mainline volume growth.

4.0 Impacts of No-Action Alternative

The No-Action Alternative, also referred to as the No-Build condition, assumes that the I-25 capacity improvements described in the Proposed Action would not be undertaken. Other roadway projects, including Interchange safety projects that are currently under construction, or planned for construction as approved projects, are assumed to be implemented in the No-Action Alternative.

4.1 Mainline I-25 and Interchanges

The AWDT for the No-Build condition is shown in Figures 8A and 8B – 2025 No-Build – I-25 Mainline Average Daily Traffic Volumes. For corresponding morning and evening peak periods, the annual growth rates reflected by mainline segment are presented below in Table 6.

TABLE 6

2025 No-Build – Peak Hour Mainline Annual Growth Rates

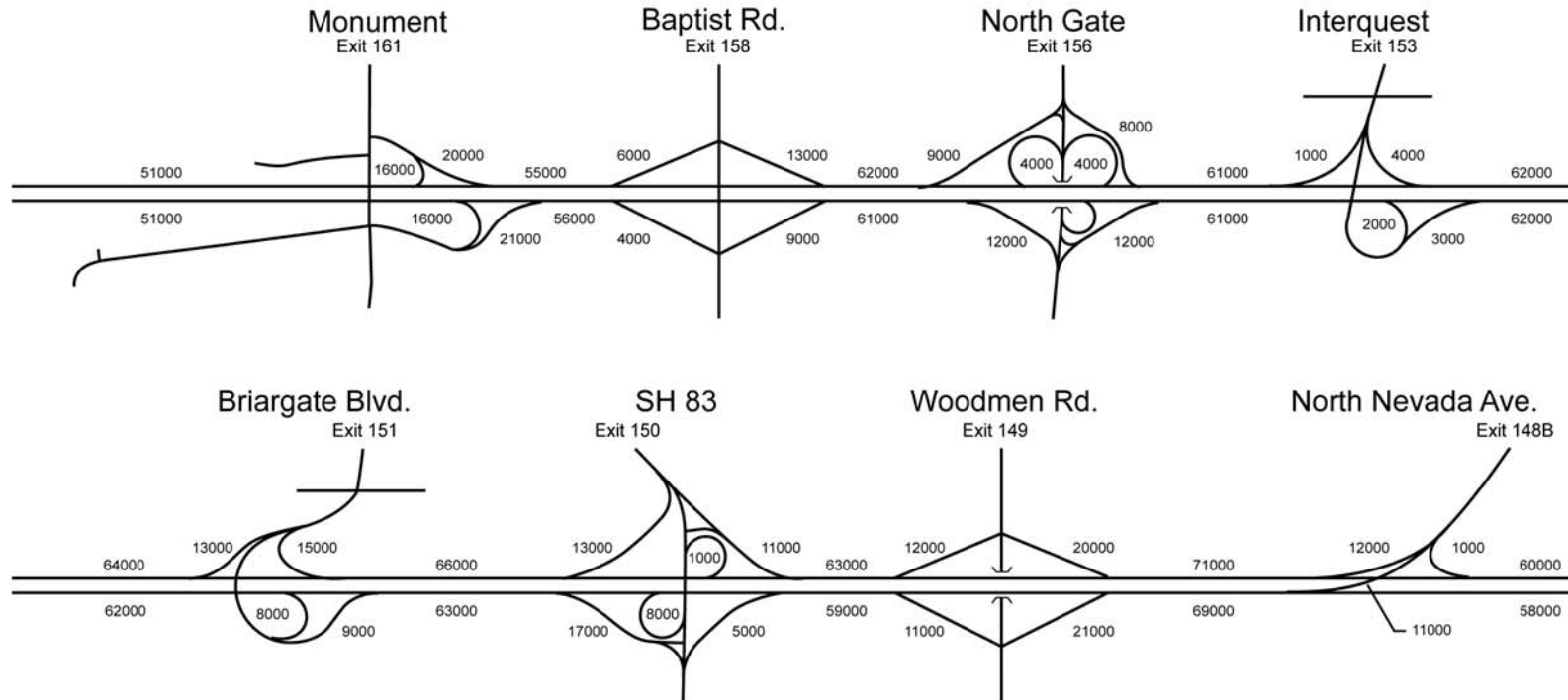
Interchange	Southbound		Northbound	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Monument/State Highway 105	0.2%	1.9%	1.5%	2.5%
Baptist	0.2%	2.5%	1.8%	2.2%
North Gate	1.2%	1.1%	0.5%	2.3%
Powers	1.2%	1.3%	0.5%	2.4%
Interquest	1.0%	1.3%	-0.5%	2.3%
Ackerman Overlook	1.0%	1.3%	-0.5%	2.3%
Briargate	0.8%	0.6%	-0.6%	2.2%
North Academy	1.1%	0.5%	-0.5%	1.3%
Woodmen	0.2%	0.7%	-0.6%	1.8%
N. Nevada/Rockrimmon Complex	0.1%	0.3%	0.0%	2.6%
Garden of the Gods	0.4%	-0.3%	0.3%	4.1%
Fillmore	0.3%	0.7%	0.1%	3.1%
Fontanero	0.9%	0.3%	-0.1%	2.0%
Uintah	1.3%	1.6%	0.6%	3.1%
Bijou	0.9%	1.5%	0.5%	3.2%
Cimarron/US 24	1.0%	1.6%	0.5%	3.5%
S. Nevada/Tejon	1.8%	2.0%	0.7%	3.4%
MLK/US 24 Bypass	1.7%	0.8%	-0.4%	3.4%
S. Circle/Lake	0.2%	1.0%	0.1%	4.2%
South Academy	0.0%	1.2%	-0.2%	5.1%

The No-Build condition reflects a capacity restraint on the I-25 corridor that diverts traffic to the local roadway network. Traffic is diverted away from the interstate corridor when volume densities approach crawl speed levels (about 60-70 vehicles per lane per hour). The diverted traffic begins to affect the local roadway network as the mainline I-25 volumes reach LOS E and LOS F in the basic freeway segments. The HCS LOS for the No-Build condition is shown Table 7 – Analysis Results for Year 2025 No-Build Conditions on Interstate 25.

It was assumed that the base free-flow speed for the HCS analysis is 60 miles per hour, which is equivalent to a free-flow speed of 50 to 60 mph. This value for base free-flow speed was chosen to be consistent with the noise analysis conducted for the I-25 Environmental Assessment.

Under the No-Build condition, the majority of roadway segments (basic freeway, weave sections, and ramp junctions) in both the AM and PM peak directions will operate near capacity or at a failing LOS. Restrictions to the mainline laneage create overcapacity conditions that divert drivers away from the interstate and onto the local roadway network. Overall interstate volumes are lower than the Build condition, but congestion levels are higher, especially in the peak hours.

2025 No-Build- I-25 Mainline Average Daily Traffic Volumes



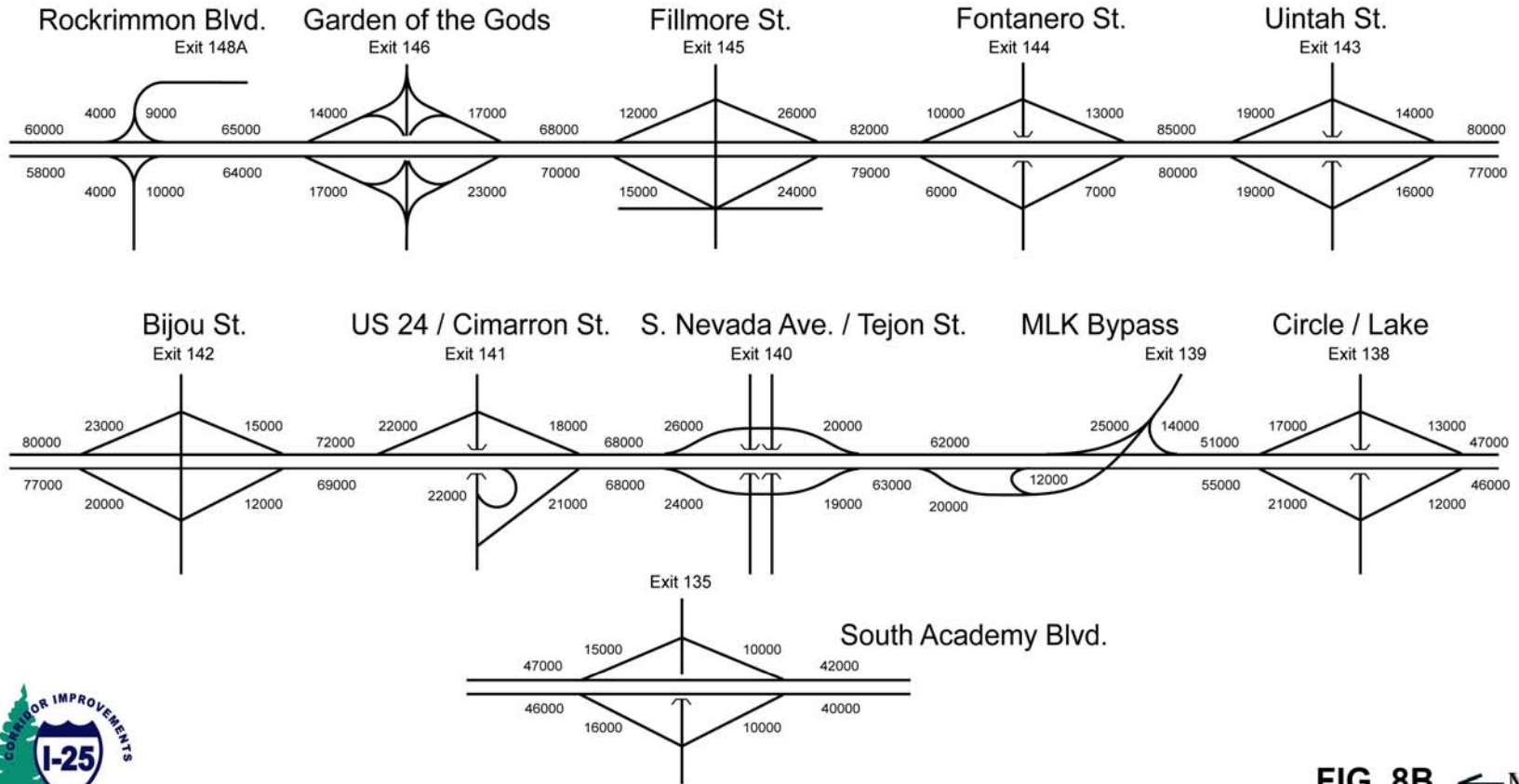
PIKES PEAK REGION
I-25 Corridor Wide Capacity Improvements

FIG. 8A ← N



FIGURE 8A
Year 2025 No-Build – I-25 Mainline Average Daily Traffic Volumes – Northern Half of Study Area

2025 No-Build- I-25 Mainline Average Daily Traffic Volumes



I-25 Corridor Wide Capacity Improvements

FIG. 8B ← N



FIGURE 8B
Year 2025 No-Build – I-25 Mainline Average Daily Traffic Volumes – Southern Half of Study Area

TABLE 7
Analysis Results for Year 2025 No-Build Conditions on Interstate 25

Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of- Service (LOS)
From Exit	To Exit					
Northbound I-25						
AM Peak Hour						
135	S. Academy	138	S. Circle	On Ramp	33.2	D
				Basic Freeway	*	F
				Off Ramp	29.7	D
138	S. Circle	139	MLK US 24 Bypass	Weave	20.4	C
139	MLK US 24 Bypass	140	S. Nevada/Tejon	On Ramp	29.9	D
				Basic Freeway	31.2	D
				Off Ramp	17.1	B
140	S. Nevada/Tejon	141	Cimarron	On Ramp	35.4	E
				Basic Freeway	42.5	E
				Off Ramp	*	F
141	Cimarron	142	Bijou	Weave	*	F
142	Bijou	143	Uintah	Weave	36.8	E
143	Uintah	144	Fontanero	Weave	20.1	C
144	Fontanero	145	Fillmore	On Ramp	23.1	C
				Basic Freeway	32.6	D
				Off Ramp	*	F
145	Fillmore	146	Garden of the Gods	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	28.4	D
146	Garden of the Gods	148	Rockrimmon	On Ramp	30.4	D
				Basic Freeway	*	F
				Off Ramp		C
148	Rockrimmon	148	N. Nevada	Weave		D
148	N. Nevada	149	Woodmen Road	On Ramp		B
				Basic Freeway	27.0	D
				Off Ramp	0.0#	A
149	Woodmen	150	N. Academy	On Ramp	13.4	B
				Basic Freeway	22.8	C
				Off Ramp	18.3	B
150	N. Academy	151	Briargate	On Loop	16.4	B
				On Ramp	30.4	D
				Basic Freeway	18.7	C
				Off Ramp	19.3	B
151	Briargate	153	Interquest	On Ramp	25.6	C
				Basic Freeway	25.6	C
				Off Ramp	16.7	B
153	Interquest	156	North Gate	On Ramp	18.3	B
				Basic Freeway	23.0	C
				Off Ramp	24.4	C
156	North Gate	158	Baptist	Weave	12.2	B
				On Ramp	26.6	C
				Basic Freeway	23.0	C
				Off Ramp	27.2	C
158	Baptist	161	Monument	On Ramp	22.2	C
				Basic Freeway	20.1	C
				Off Ramp	10.5	B

TABLE 7
Analysis Results for Year 2025 No-Build Conditions on Interstate 25

Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit		To Exit				
161	Monument	163	County Line Rd.	On Ramp	13.0	B
PM Peak Hour						
135	S. Academy	138	S. Circle	On Ramp	33.7	D
				Basic Freeway	*	F
				Off Ramp	30.3	D
138	S. Circle	139	MLK US 24 Bypass	Weave	24.8	C
139	MLK US 24 Bypass	140	S. Nevada/Tejon	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	23.8	C
140	S. Nevada/Tejon	141	Cimarron	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	*	F
141	Cimarron	142	Bijou	Weave	*	F
142	Bijou	143	Uintah	Weave	*	F
143	Uintah	144	Fontanero	Weave	23.2	C
144	Fontanero	145	Fillmore	On Ramp	28.5	D
				Basic Freeway	42.0	E
				Off Ramp	*	F
145	Fillmore	146	Garden of the Gods	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	*	F
146	Garden of the Gods	148	Rockrimmon	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp		C
148	Rockrimmon	148	N. Nevada	Weave		B
148	N. Nevada	149	Woodmen	On Ramp		C
				Basic Freeway	*	F
				Off Ramp	*	F
149	Woodmen	150	N. Academy	On Ramp	26.5	F
				Basic Freeway	33.3	D
				Off Ramp	28.7	D
150	N. Academy	151	Briargate	On Loop	26.0	C
				On Ramp	*	F
				Basic Freeway	32.6	D
151	Briargate	153	Interquest	Off Ramp	38.4	E
				On Ramp	*	F
				Basic Freeway	*	F
153	Interquest	156	North Gate	Off Ramp	*	F
				On Ramp	*	F
				Basic Freeway	*	F
156	North Gate	158	Baptist	Weave	23.3	C
				On Ramp	*	F
				Basic Freeway	*	F
158	Baptist	161	Monument	Off Ramp	*	F
				On Ramp	34.3	D
				Basic Freeway	39.7	D
				Off Ramp	17.3	B

TABLE 7
Analysis Results for Year 2025 No-Build Conditions on Interstate 25

Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
161	Monument	County Line		On Ramp	18.1	B
Southbound I-25						
AM Peak Hour						
163	County Line Rd.	161	Monument	Off Ramp	11.3	B
161	Monument	158	Baptist	On Ramp	24.6	C
				Basic Freeway	25.4	C
				Off Ramp	29.7	D
158	Baptist	156	North Gate	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	*	F
156	North Gate	153	Interquest	Off Loop	*	F
				On Ramp	*	F
				Basic Freeway	*	F
153	Interquest	152	Ackerman Overlook	Off Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	*	F
152	Ackerman Overlook	151	Briargate	Weave	36.6	E
				On Ramp	*	F
				Basic Freeway	38.6	E
151	Briargate	150	N. Academy	Off Ramp	*	F
				On Ramp	*	F
				Basic Freeway	40.7	E
150	N. Academy	149	Woodmen	Off Ramp	*	F
				On Loop	*	F
				Basic Freeway	43.5	E
149	Woodmen	148	N. Nevada	On Ramp	*	F
				Basic Freeway	43.5	E
				Off Ramp		E
148	N. Nevada	148	Rockrimmon	Off Ramp left		E
				On Ramp		A
				Off Ramp		A
148	Rockrimmon	146	Garden of the Gods	On Ramp		D
				Basic Freeway	*	F
				Off Ramp	33.1	D
146	Garden of the Gods	145	Fillmore	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	*	F
145	Fillmore	144	Fontanero	Basic Freeway	*	F
				Off Ramp	24.0	C
144	Fontanero	143	Uintah	Weave	25.4	C
143	Uintah	142	Bijou	Weave	*	F
142	Bijou	141	Cimarron	On Ramp	32.2	D
				Basic Freeway	37.2	E
				Off Ramp	*	F
141	Cimarron	140	S. Nevada/Tejon	On Ramp	*	F
				Basic Freeway	44.9	E
				Off Ramp	0.0#	A
140	S. Nevada/Tejon	139	MLK US 24 Bypass	Weave	19.9	B

TABLE 7
Analysis Results for Year 2025 No-Build Conditions on Interstate 25

Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
139	MLK US 24 Bypass	138	S. Circle	On Ramp	18.9	B
				Basic Freeway	20.9	C
				Off Ramp	0.0#	A
138	S. Circle	135	S. Academy	On Ramp	31.5	D
				Basic Freeway	34.9	D
				Off Ramp	22.6	C
135	S. Academy	132	State Highway 16	On Ramp	28.0	C
PM Peak Hour						
163	County Line Rd.	161	Monument	Off Ramp	13	B
161	Monument	158	Baptist	On Ramp	28.3	D
				Basic Freeway	30.8	D
				Off Ramp	33.8	D
158	Baptist	156	North Gate	On Ramp	*	F
				Basic Freeway	*	E
				Off Ramp	*	F
156	North Gate	153	Interquest	Off Loop	*	F
				On Ramp	32.9	D
				Basic Freeway	38.9	D
153	Interquest	152	Ackerman Overlook	Off Ramp	27.7	C
				On Ramp	*	F
				Basic Freeway	*	F
152	Ackerman Overlook	151	Briargate	Off Ramp	*	F
				Weave	32.8	D
				On Ramp	11.8	B
151	Briargate	150	N. Academy	Basic Freeway	23.6	C
				Off Ramp	19.0	B
				On Loop	23.0	C
150	N. Academy	149	Woodmen	On Ramp	*	F
				Basic Freeway	31.8	D
				Off Ramp	18.6	B
149	Woodmen	148	N. Nevada	On Ramp	*	F
				Basic Freeway	33.8	D
				Off Ramp		E
148	N. Nevada	148	Rockrimmon	Off Ramp left		E
				On Ramp		E
				Off Ramp		E
148	Rockrimmon	146	Garden of the Gods	On Ramp		D
				Basic Freeway	*	F
				Off Ramp	20.3	C
146	Garden of the Gods	145	Fillmore	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	*	F
145	Fillmore	144	Fontanero	Basic Freeway	*	F
				Off Ramp		B
144	Fontanero	143	Uintah	Weave	19.4	D
143	Uintah	142	Bijou	Weave	29.2	E
					41.3	E

TABLE 7
Analysis Results for Year 2025 No-Build Conditions on Interstate 25

Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
142	Bijou	141	Cimarron	On Ramp	33.6	D
				Basic Freeway	39.7	E
				Off Ramp	*	F
141	Cimarron	140	S. Nevada/Tejon	On Ramp	*	F
				Basic Freeway	*	F
				Off Ramp	0.0#	A
140	S. Nevada/Tejon	139	MLK US 24 Bypass	Weave	22.0	C
139	MLK US 24 Bypass	138	S. Circle	On Ramp	20.8	C
				Basic Freeway	23.3	C
				Off Ramp	0.0#	A
138	S. Circle	135	S. Academy	On Ramp	34.0	D
				Basic Freeway	39.5	E
				Off Ramp	23.7	C
135	S. Academy	132	State Highway 16	On Ramp	30.3	D

* Overall results are not computed when the LOS is an F

HCS computed negative density value changed to 0.0 pc/mi/ln

The following observations are made from Table 7:

- Northbound I-25

Thirteen basic freeway, six weaving, and 28 ramp (merge or diverge) sections were analyzed

- AM Peak Hour

- Of the 13 basic freeway sections, LOS E or F would be experienced in 31 percent of the sections. The remaining 69 percent of the sections would experience LOS C or D. None of the sections would experience LOS A or B.
- Of the six weaving sections, 50 percent of the sections experienced LOS C or D, while 18 percent of the sections would operate at LOS A or B. Thirty-two percent of the sections were estimated to operate LOS E or F.
- Of the 28 ramp junctions analyzed, 14 percent of the junctions are estimated to operate at LOS E or F. Forty-seven percent of the ramp junctions would operate at LOS C or D, while the remaining 39 percent are estimated to operate at LOS A or B.

- PM Peak Hour

- Seventy-seven percent of the basic freeway sections analyzed would operate at LOS E or F, while the remaining 23 percent of the sections would operate at LOS C or D. None of the basic freeway sections are estimated to operate at LOS A or B.

- Of the six weaving sections, 33 percent are estimated to operate at LOS E or F. Fifty percent of the sections would operate at LOS C or D, while the remaining 17 percent are estimated to operate at LOS A or B.
 - Of the 28 ramp junctions analyzed, 61 percent are estimated to operate at LOS E or F, 32 percent at LOS C or D, and the remaining 7 percent at LOS A or B.
- Southbound I-25

Fourteen basic freeway, four weaving, and 34 ramp (merge or diverge) sections were analyzed.

– AM Peak Hour

- Of the 14 basic freeway sections, LOS E or F would be experienced in 79 percent of the sections. The remaining 21 percent of the sections would operate at LOS C or D. None of the basic freeway sections would operate at LOS A or B.
- Of the four weaving sections, 50 percent of the sections would experience LOS E or F and 25 percent of sections would operate at LOS C or D. Twenty-five percent of the sections were estimated to operate LOS A or B.
- Of the 34 ramp junctions analyzed, 56 percent of the junctions are estimated to operate at LOS E or F. Twenty-six percent of the ramp junctions would operate at LOS C or D, while the remaining 18 percent are estimated to operate at LOS A or B.

– PM Peak Hour

- Of the 14 basic freeway sections analyzed, 57 percent of the sections are estimated to operate at LOS E or F. The remaining 43 percent of the sections are estimated to operate at LOS C or D. None of the sections are estimated to operate at LOS A or B.
- Of the four weaving sections, 75 percent are estimated to operate at LOS C or D, while the remaining 25 percent are estimated to operate at LOS E or F. None of the weaving sections are estimated to operate at LOS A or B.
- Of the 34 ramp junctions analyzed, 44 percent are estimated to operate at LOS E or F, 35 percent at LOS C or D, and the remaining 21 percent at LOS A or B.

These observations are summarized in Table 8 – Observations from the LOS and Capacity Analysis for Year 2025 No-Build Conditions on Interstate 25.

TABLE 8

Observations from the LOS and Capacity Analysis for Year 2025 No-Build Conditions on Interstate 25

Direction	Peak Period	Freeway Facility	Total Analyzed	Percentage		
				LOS E or F	LOS C or D	LOS A or B
Northbound	AM Peak	Basic Freeway	13	30.8	69.2	0.0
		Weaving	6	33.3	50.0	17.7
		Ramp Junction	28	14.3	46.4	39.3
	PM Peak	Basic Freeway	13	76.9	23.1	0.0
		Weaving	6	33.3	50.0	17.7
		Ramp Junction	28	60.7	32.2	7.1
Southbound	AM Peak	Basic Freeway	14	78.6	21.4	0.0
		Weaving	4	50.0	25.0	25.0
		Ramp Junction	34	55.9	26.5	17.6
	PM Peak	Basic Freeway	14	57.1	42.3	0.0
		Weaving	4	25.0	75.0	0.0
		Ramp Junction	34	44.1	35.3	20.6

4.2 Cross Roads

The 2000 HCM was used to evaluate the LOS for each signalized intersection at the ramp terminals from I-25. The HCS evaluation assumed that current timings used for the Existing condition analysis could be modified for the No-Build condition. The HCS LOS analysis for the crossroad ramp terminals is shown in Table 9 – No-Build HCS LOS Analysis of the Interchange Ramp Terminals.

TABLE 9

No-Build HCS LOS Analysis of the Interchange Ramp Terminals

Interchange Intersection	Peak Hour	Signal Location	Existing	2025 No-Build
161- Monument	am	West	C	C
		East	C	E
		Center	C	C
	pm	West	C	D
		East	D	F
		Center	C	F
153- Interquest Pkwy	am	w/ 83	C	D
	pm	w/ 83	B	C
151- Briargate Pkwy	am	w/ 83	C	E
	pm	w/ 83	C	E
150- N. Academy	am	East	A	A
		West	A	B
	pm	East	A	B
		West	A	B
149- Woodmen	am	East	F	D*
		West	F	B
	pm	East	F	E
		West	F	B
146- Garden of the Gods	am	Center	D	D
	pm	Center	C	F
145- Fillmore	am	East	C	D

TABLE 9
No-Build HCS LOS Analysis of the Interchange Ramp Terminals

Interchange Intersection	Peak Hour	Signal Location	Existing	2025 No-Build
		West	D	F
	pm	East	C	F
		West	F	F
144- Fontanero	am	East	--	B
		West	--	A
	pm	East	--	B
		West	--	C
143- Uintah	am	East	C	C
		West	C	C
	pm	East	B	B
		West	B	C
140- S. Nevada/Tejon	am	Tejon North	A	C
		Tejon South	C	D
		Nevada North	C	C
		Nevada South	F	B
	pm	Tejon North	A	C
		Tejon South	C	C
		Nevada North	B	C
		Nevada South	F	C
138- Circle/Lake	am	East	B	B
		West	C	C
	pm	East	B	C
		West	C	D
135- S. Academy	am	West	B	B
		East	B	B
	pm	West	C	E
		East	B	D

*Note that the No-Build condition for Woodmen includes safety improvements that are currently approved and under construction.

- The **Monument/State Highway 105** ramp terminals operate at LOS C/D for the southbound ramps in the AM and PM peak hours. The northbound on and off ramps operate near capacity (LOS D/E) in the AM peak hour and at LOS F in the PM peak hour. The failing LOS is due to the heavy westbound traffic on State Highway 105 and the heavy northbound off ramp traffic from I-25. In general, the LOS in the No-Build condition is worse than the Existing condition. Development to the north of Colorado Springs puts increased pressure on the interchange and contributes to the poor LOS.
- The **Interquest Parkway** ramps intersect State Highway 83 about ¾-mile east of I-25. The intersection operates at LOS D in the AM peak hour and LOS C during the PM peak hour.
- The **Briargate Parkway** ramps intersect State Highway 83 north of Colorado Springs. The intersection operates at LOS E during both peak hours, which is a deterioration of LOS compared to the Existing condition. Increased development pressure in the area around Briargate contributes to the increased volume of traffic.
- The **North Academy** ramp terminals operate at LOS A/B during the AM peak hour and at LOS B during the PM peak hour. This is a slight deterioration compared to existing.

- The **Woodmen Road** interchange is assumed reconstructed in the No-Build condition because it is currently under construction. The improved ramp terminals can also be retimed in the 2025 No-Build condition to accommodate the new volumes. The ramp terminals can operate close to capacity (D/E) in the AM peak hour and LOS B during the PM peak hour.
- The **Garden of the Gods** interchange is a single-point urban interchange with one center signalized intersection. The intersection operates at LOS D in the AM peak hour and LOS F in the PM peak hour. The failing LOS is mainly caused by the heavy eastbound through movements and westbound on ramp volumes. The heavy northbound left turn onto Garden of the Gods Road also contributes to the poor LOS.
- The **Fontanero Street** ramp terminals operate well in both the AM and PM peak hours. The east ramp operates at LOS B in both peak hours and the west ramp operates at LOS A in the AM and LOS C in the PM.
- The **Uintah Street** ramp terminals currently operate well at LOS C during the AM peak hour and LOS B/C for the PM peak hour with little change over the Existing condition.
- The **Nevada Avenue/Tejon Street** interchange is assumed reconstructed in the No-Build condition because it is currently under construction. Even with increased volumes for the 2025 No-Build condition, the ramp terminals can be retimed and the signal phases optimized to get a better LOS than currently exists. The levels of service range from LOS B to LOS D.
- The **US 24 Bypass** does not have ramp terminals with signalized intersections. The ramps merge to the east to become a bypass highway (Fountain Road).
- The **Circle Drive/Lake Avenue** ramp terminals operate well during both peak periods at LOS B/C for the east ramp and LOS C/D for the west ramp. During the PM peak hour, the operations of these signals are generally worse than the Existing condition.
- The **South Academy** ramp terminals currently operate well at LOS B during the AM peak hour with little change from the Existing condition. The signals approach LOS D/E during the PM peak hour, which is worse than the Existing condition even after optimizing the signal cycle.

5.0 Direct Impacts of Proposed Action

5.1 2025 Build Volumes, Capacity Analysis, and LOS for Mainline I-25 and Interchanges

Mainline volumes for the Proposed Action, also referred to as the 2025 Build condition, were developed as discussed in the Methodology section of this technical memorandum. The proposed laneage includes a high-occupancy vehicle (HOV) lane from north of Briargate Parkway to the Martin Luther King/US 24 Bypass interchange to the south. The improved laneage on I-25 also includes auxiliary lanes between interchanges between Powers Boulevard and Circle Drive.

Average daily traffic in the corridor for the Build condition (2025) is shown in Figures 9a and 9b – 2025 Build – I-25 Mainline Average Daily Traffic Volumes. The growth rates for the Build condition corridor are shown in Table 10 – 2025 Build – Peak Hour Mainline Annual Growth Rates.

The capacity analysis for the Build condition assumed an HOV lane between the Briargate Parkway and the Martin Luther King/US 24 Bypass. The analysis does not specifically evaluate the HOV lane. Instead, an analysis of the freeway without the HOV lane was conducted to find a baseline for the HOV analysis. The baseline analysis showed that an additional general purpose lane was enough to operate under capacity. The addition of the HOV lane provides just enough additional capacity to bring all lanes to LOS C or better (in most cases), including the HOV lane.

2025 Build - I-25 Mainline Average Daily Traffic Volumes

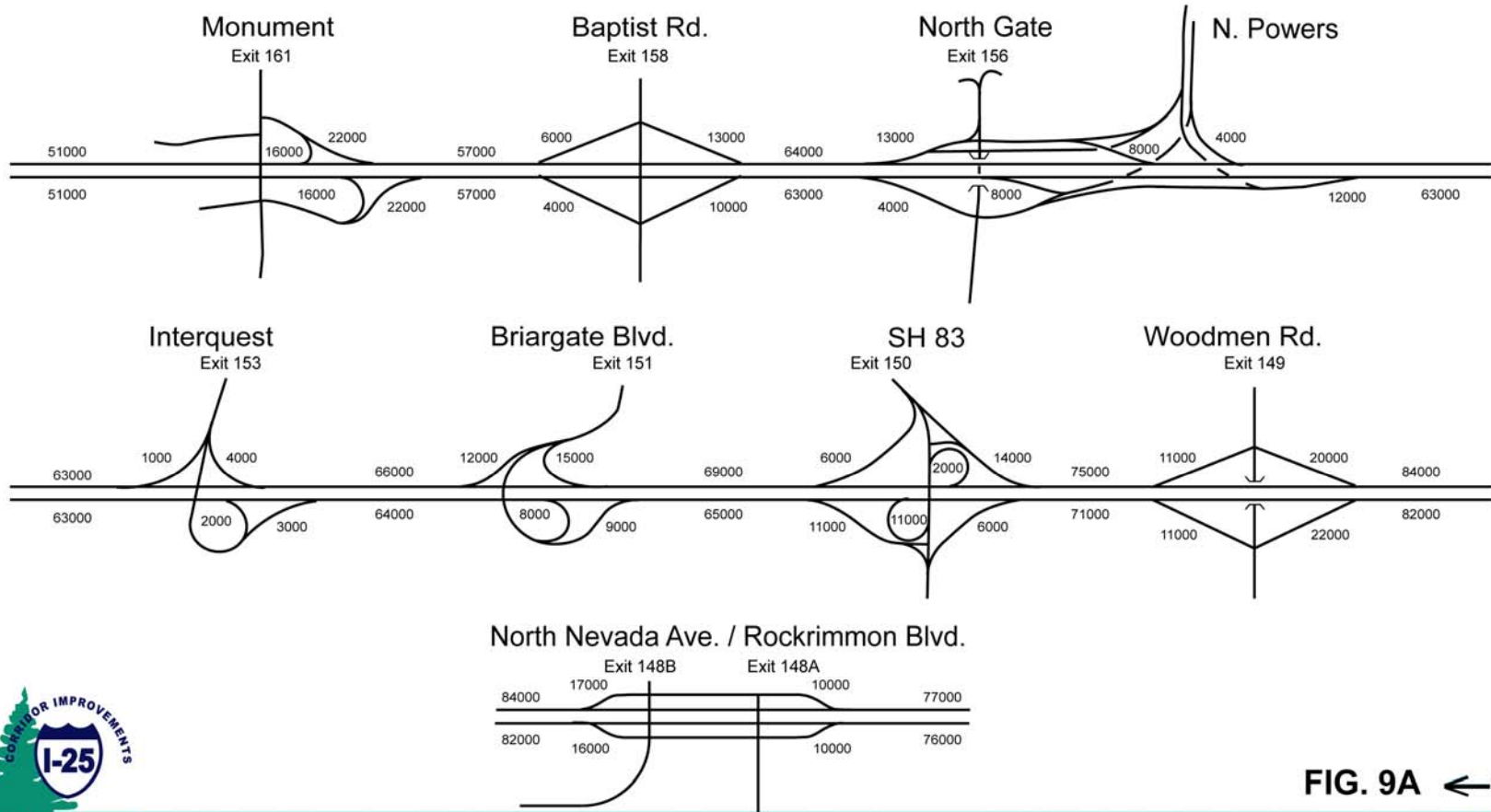


FIG. 9A ← N



I-25 Corridor Wide Capacity Improvements



FIGURE 9A
Year 2025 Build – I-25 Mainline Average Daily Traffic Volumes – Northern Half of Study Area

2025 Build - I-25 Mainline Average Daily Traffic Volumes

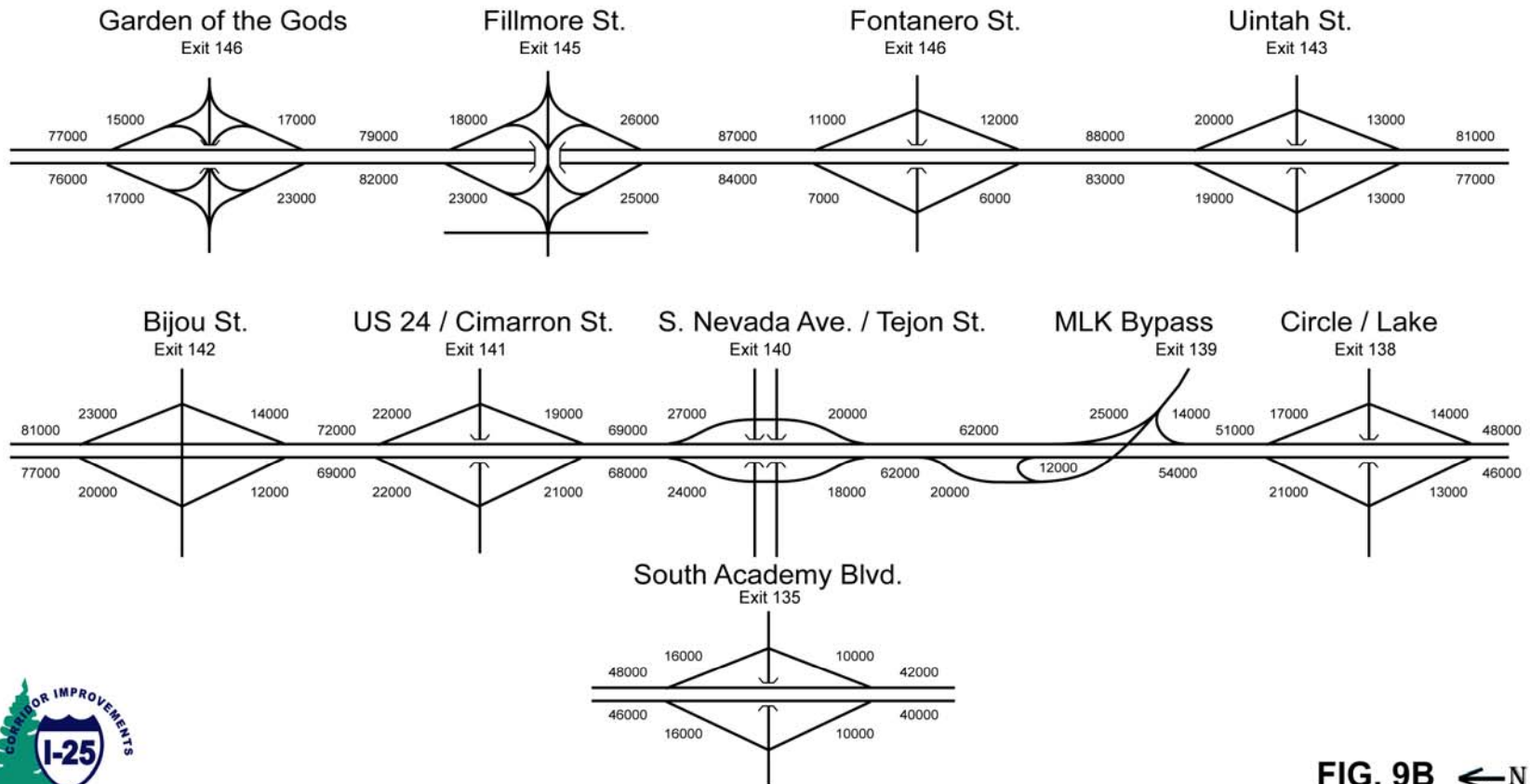


FIG. 9B ← N



I-25 Corridor Wide Capacity Improvements



FIGURE 9B
Year 2025 Build – I-25 Mainline Average Daily Traffic Volumes – Northern Half of Study Area

TABLE 10
2025 Build – Peak Hour Mainline Annual Growth Rates

Interchange	Southbound		Northbound	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Monument/State Highway 105	0.8%	1.2%	1.5%	1.5%
Baptist	1.6%	1.4%	1.6%	2.0%
North Gate	1.4%	0.3%	1.1%	1.4%
Powers	1.2%	0.4%	1.0%	1.5%
Interquest	1.2%	0.3%	1.1%	1.6%
Briargate	1.3%	0.3%	1.1%	1.6%
North Academy	1.4%	0.3%	1.2%	1.6%
Woodmen	1.3%	0.4%	1.2%	1.3%
N. Nevada/Rockrimmon Complex	1.6%	0.7%	1.2%	2.2%
Garden of the Gods	1.5%	0.5%	1.0%	2.1%
Fillmore	1.2%	0.6%	0.5%	1.5%
Fontanero	1.3%	0.8%	0.9%	1.7%
Uintah	0.9%	0.8%	1.0%	1.7%
Bijou	0.4%	1.0%	1.0%	1.9%
Cimarron/US 24	0.8%	1.0%	1.2%	1.8%
S. Nevada/Tejon	0.9%	0.5%	0.9%	1.7%
MLK US 24 Bypass	0.9%	0.4%	1.0%	1.8%
Circle/Lake	0.2%	0.3%	0.9%	1.9%
South Academy	0.2%	0.1%	0.9%	2.0%

It was assumed that the base free flow speed for the HCS analysis is 60 mph, which is equivalent to a free flow speed of 50 to 60 mph. This value for base free flow speed was chosen to be consistent with the noise analysis conducted for the I-25 Environmental Assessment.

The capacity analysis of the Build condition is shown in Table 11 – Analysis Results for Build Conditions on Interstate 25.

TABLE 11
Analysis Results for Build Conditions on Interstate 25

I-25 Year 2025 Traffic Conditions for the Proposed Action						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
Northbound I-25						
AM Peak Hour						
135	S. Academy	138	S. Circle	Basic Freeway	28.0	D
				Off Ramp	0.0 [#]	A
138	S. Circle	139	MLK US 24 Bypass	Weave	17.6	B
139	MLK US 24 Bypass	140	S. Nevada/Tejon	Weave	21.5	C
140	S. Nevada/Tejon	141	Cimarron	On Ramp	14.6	B
				Basic Freeway	24.4	C
				Off Ramp	18.7	B
141	Cimarron	142	Bijou	Weave	24.1	C
142	Bijou	143	Uintah	Weave	19.9	B
143	Uintah	144	Fontanero	Weave	7.5	A
144	Fontanero	145	Fillmore	Weave	5.9	A
145	Fillmore	146	Garden of the Gods	On Ramp	0.0 [#]	A
				Basic Freeway	16.3	B
				Off Ramp	0.0 [#]	A

TABLE 11
Analysis Results for Build Conditions on Interstate 25

I-25 Year 2025 Traffic Conditions for the Proposed Action						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
146	Garden of the Gods	148	N. Nevada/ Rockrimmon	On Ramp	6.1	A
				Basic Freeway	14.4	B
				Off Ramp	0.0 [#]	A
148	N. Nevada/ Rockrimmon	149	Woodmen	Basic Freeway	14.5	B
				Off Ramp	0.0 [#]	A
149	Woodmen	150	N. Academy	On Ramp	17.5	B
				Basic Freeway	12.4	B
				Off Ramp	0.0 [#]	A
150	N. Academy	151	Briargate	On Loop	10.1	B
				On Ramp	15.2	B
				Basic Freeway	18.1	C
				Off Ramp	0.0 [#]	A
151	Briargate	153	Interquest	On Ramp	14.6	B
				Basic Freeway – HOV	9.4	A
				Basic Freeway – no HOV	11.9	B
				Off Ramp	6.7	A
153	Interquest	156	Powers/ North Gate	On Ramp	15.5	B
				Basic Freeway	14.9	B
				Off Ramp	16.9	B
				Off Ramp	17.2	B
156	Powers/ North Gate	158	Baptist	Basic Freeway	12.3	B
158	Baptist	161	Monument	On Ramp	14.9	B
				Basic Freeway	13.1	B
				Off Ramp	14.4	B
161	Monument	163	County Line Rd.	On Ramp	13.0	B
PM Peak Hour						
135	S. Academy	138	S. Circle	Basic Freeway	29.8	D
				Off Ramp	0.0 [#]	A
138	S. Circle	139	MLK US 24 Bypass	Weave	19.7	B
139	MLK US 24 Bypass	140	S. Nevada/Tejon	Weave	25.2	C
140	S. Nevada/Tejon	141	Cimarron	On Ramp	21.8	C
				Basic Freeway	24.1	C
				Off Ramp	23.2	C
141	Cimarron	142	Bijou	Weave	30.0	D
142	Bijou	143	Uintah	Weave	24.6	C
143	Uintah	144	Fontanero	Weave	7.5	A
144	Fontanero	145	Fillmore	Weave	6.5	A
145	Fillmore	146	Garden of the Gods	On Ramp	4.2	A
				Basic Freeway	21.7	C
				Off Ramp	0.0 [#]	A
146	Garden of the Gods	148	Rockrimmon/ N. Nevada	On Ramp	25.7	C
				Basic Freeway	23.5	C
				Off Ramp	0.0 [#]	A
148	Rockrimmon/ N. Nevada	149	Woodmen	Basic Freeway	23.2	C
				Off Ramp	0.0 [#]	A

TABLE 11
Analysis Results for Build Conditions on Interstate 25

I-25 Year 2025 Traffic Conditions for the Proposed Action						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
149	Woodmen	150	N. Academy	On Ramp	28.0	D
				Basic Freeway	19.3	C
				Off Ramp	0.0 [#]	A
150	N. Academy	151	Briargate	On Loop	21.2	C
				On Ramp	18.7	B
				Basic Freeway	18.1	C
151	Briargate	153	Interquest	Off Ramp	0.0 [#]	A
				On Ramp	23.7	C
				Basic Freeway – HOV	15.2	B
153	Interquest	156	Powers/ North Gate	Basic Freeway – NO HOV	19.4	C
				Off Ramp	18.5	B
				On Ramp	24.8	C
156	Powers/ North Gate	158	Baptist	Basic Freeway	24.2	C
				Off Ramp	20.1	C
				Off Ramp	26.7	C
158	Baptist	161	Monument	Basic Freeway	23.2	C
				On Ramp	24.9	C
				Off Ramp	21.3	C
161	Monument	163	County Line Rd.	On Ramp	18.1	B
Southbound I-25						
AM Peak Hour						
163	County Line Rd.	161	Monument	Off Ramp	11.3	B
161	Monument	158	Baptist	On Ramp	32.9	D
				Basic Freeway	19.6	C
				Off Ramp	23.6	C
158	Baptist	156	Powers/ North Gate	Basic Freeway	24.2	C
				Off Ramp	26.7	C
				On Ramp	8.9	A
156	Powers/ North Gate	153	Interquest	Basic Freeway	30.6	D
				Off Ramp	30.2	D
				Weave	23.1	B
152	Ackerman Overlook	151	Briargate	Basic Freeway – No HOV	23.3	C
				Basic Freeway – HOV	17.2	B
				Off Ramp	0.0 [#]	A
151	Briargate	150	N. Academy	On Ramp	10.8	B
				Basic Freeway	21.9	C
				Off Ramp	20.3	C
150	N. Academy	149	Woodmen	On Ramp	21.1	C
				Basic Freeway	23.4	C
				Off Ramp	22.1	C
149	Woodmen	148	Rockrimmon/ N. Nevada	Basic Freeway	27.4	D
				Off Ramp	0.0 [#]	A

TABLE 11
Analysis Results for Build Conditions on Interstate 25

I-25 Year 2025 Traffic Conditions for the Proposed Action						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit	To Exit					
148	Rockrimmon/ N. Nevada	146	Garden of the Gods	On Ramp		C
				Basic Freeway	25.1	C
				Off Ramp	13.1	B
146	Garden of the Gods	145	Fillmore	On Ramp	8.3	A
				Basic Freeway	22.8	C
				Off Ramp	0.0 [#]	A
145	Fillmore	144	Fontanero	Weave	8.7	A
144	Fontanero	143	Uintah	Weave	14.6	B
143	Uintah	142	Bijou	Weave	27.0	C
142	Bijou	141	Cimarron	Weave	7.8	C
141	Cimarron	140	S. Nevada/Tejon	On Ramp	25.2	C
				Basic Freeway	21.8	C
				Off Ramp	0.0 [#]	A
140	S. Nevada/Tejon	139	MLK US 24 Bypass	Weave	16.6	B
139	MLK US 24 Bypass	138	S. Circle	On Ramp	16.9	B
				Basic Freeway	18.7	C
				Off Ramp	0.0 [#]	A
138	S. Circle	135	S. Academy	On Ramp	21.4	C
				Basic Freeway	25.5	C
				Off Ramp	0.0 [#]	A
PM Peak Hour						
163	County Line	161	Monument	Off Ramp	13.0	B
161	Monument	158	Baptist	On Ramp	34.0	D
				Basic Freeway	19.6	C
				Off Ramp	25.9	C
158	Baptist	156	Powers/ North Gate	Basic Freeway	17.9	B
				Off Ramp	20.3	C
156	Powers/ North Gate	153	Interquest	On Ramp	3.3	A
				Basic Freeway	20.1	C
				Off Ramp	21.5	C
153	Interquest	152	Ackerman Overlook	Weave	17.4	B
152	Ackerman Overlook	151	Briargate	Basic Freeway – No HOV	16.1	B
				Basic Freeway – HOV	12.9	B
				Off Ramp	0.0 [#]	A
151	Briargate Parkway	150	N. Academy	On Ramp	5.3	A
				Basic Freeway	14.3	B
				Off Ramp	10.2	B
150	N. Academy	149	Woodmen	On Ramp	20.6	C
				Basic Freeway	17.2	B
				Off Ramp	14.3	B
149	Woodmen	148	Rockrimmon/Nevada	Basic Freeway	18.3	C
				Off Ramp	0.0 [#]	A
148	Rockrimmon/ Nevada	146	Garden of the Gods	On Ramp		B
				Basic Freeway	21.1	C
				Off Ramp	6.6	A

TABLE 11
Analysis Results for Build Conditions on Interstate 25

I-25 Year 2025 Traffic Conditions for the Proposed Action						
Freeway Section				Type of Analysis	Density (pc/mi/ln)	Level-of-Service (LOS)
From Exit		To Exit				
146	Garden of the Gods	145	Fillmore	On Ramp	11.3	B
				Basic Freeway	16.3	B
				Off Ramp	0.0 [#]	A
145	Fillmore	144	Fontanero	Weave	8.9	A
144	Fontanero	143	Uintah	Weave	13.6	B
143	Uintah	142	Bijou	Weave	18.0	B
142	Bijou	141	Cimarron	Weave	20.1	C
141	Cimarron	140	S. Nevada/Tejon	On Ramp	28.1	D
				Basic Freeway	24.9	C
				Off Ramp	0.0 [#]	A
140	S. Nevada/Tejon	139	MLK US 24 Bypass	Weave	21.1	C
139	MLK US 24 Bypass	138	S. Circle	On Ramp	20.4	C
				Basic Freeway	23.4	C
				Off Ramp	0.0 [#]	A
138	S. Circle	135	S. Academy	On Ramp	24.2	C
				Basic Freeway	24.6	C
				Off Ramp	0.0 [#]	A

* Overall results are not computed when the LOS is an F

HCS computed negative density value changed to 0.0 pc/mi/ln

The following pertinent observations are made from Table 11:

- Northbound I-25

Twelve basic freeway, six weaving, and 21 ramp (merge or diverge) sections were analyzed

- AM Peak Hour

- Of the 12 basic freeway sections, LOS E or F would not be experienced for all sections of the proposed Build conditions. An estimated LOS C or D would be experienced 25 percent of the time, while the remaining 75 percent of the sections would experience LOS A or B.
- Of the six weaving sections, 33 percent of the sections would experience a LOS C or D, while the remaining 67 percent of the sections would operate at LOS A or B. None of the sections were estimated to operate at LOS E or F.
- Of the 21 ramp junctions analyzed, none of the junctions are estimated to operate at LOS C, D, E, or F. All of the ramp junctions are estimated to operate at LOS A or B.

- PM Peak Hour

- Of the 12 basic freeway sections analyzed, none are estimated to operate at LOS E or F. Ninety-two percent of the sections would operate at LOS C or D, while the remaining 8 percent would operate at LOS A or B.

- Of the six weaving sections, none are estimated to operate at LOS E or F. Fifty percent of the sections would operate at LOS C or D, while the remaining 50 percent are estimated to operate at LOS A or B.
 - Of the 21 ramp junctions analyzed, none of the sections would operate at LOS E or F. Fifty-two percent would operate at LOS C or D, while the remaining 48 percent would operate at LOS A or B.
- Southbound I-25

Thirteen basic freeway, six weaving, and 22 ramp (merge or diverge) sections were analyzed.

– AM Peak Hour

- Of the 13 basic freeway sections analyzed, none of the sections are estimated to operate at LOS E or F. Ninety-two percent of the sections were estimated to operate at LOS C or D, while the remaining 8 percent were estimated to operate at LOS A or B.
- Of the six weaving sections, 67 percent were estimated to operate at LOS A or B, while the remaining 33 percent were estimated to operate at LOS C or D. None of the sections would operate at LOS E or F.
- Of the 22 ramp junctions analyzed, 45 percent are estimated to operate at LOS C or D, and 55 percent at LOS A or B. None of the ramp junctions were estimated to operate at LOS E or F.

– PM Peak Hour

- Of the 13 basic freeway sections, LOS E or F would not be experienced in any of the sections. 54 percent of the sections would operate at LOS C or D, while the remaining 46 percent would operate at LOS A or B.
- Of the six weaving sections, 33 percent of the sections would experience LOS C or D, while the remaining 67 percent of sections would operate at LOS A or B. None of the sections were estimated to operate LOS E or F.
- Of the 22 ramp junctions analyzed, 36 percent of the junctions are estimated to operate at LOS C or D. Sixty-four percent of the ramp junctions would operate at LOS A or B. None of the ramp junctions were estimated to operate at LOS E or F.

These observations are summarized in Table 12 – Observations from the LOS and Capacity Analysis for Year 2025 Build Conditions on Interstate 25.

TABLE 12

Observations from the LOS and Capacity Analysis for Year 2025 Build Conditions on Interstate 25

Direction	Peak Period	Freeway Facility	Total Analyzed	Percentage		
				LOS E or F	LOS C or D	LOS A or B
Northbound	AM Peak	Basic Freeway	12	0.0	25.0	75.0
		Weaving	6	0.0	33.3	66.7
		Ramp Junction	21	0.0	0.0	100.0
	PM Peak	Basic Freeway	12	0.0	91.7	8.3
		Weaving	6	0.0	50.0	50.0
		Ramp Junction	21	0.0	52.4	47.6
Southbound	AM Peak	Basic Freeway	13	0.0	92.3	7.7
		Weaving	6	0.0	33.3	66.7
		Ramp Junction	22	0.0	45.5	54.5
	PM Peak	Basic Freeway	13	0.0	53.8	46.2
		Weaving	6	0.0	33.3	66.7
		Ramp Junction	22	0.0	36.4	63.6

The observations from Tables 3, 9, and 12 are combined in a graphical format and are shown in Figures 10, 11, and 12. Figure 10 shows the comparison for different scenarios of all basic freeway segments on the I-25 corridor. Figure 11 shows the comparison for different scenarios of all ramp junctions on the I-25 corridor, while Figure 12 shows the comparisons for all weaving sections. The comparison for each freeway facility is performed for the AM and PM peak hours and for the north and southbound directions of the freeway. Scenarios examined include the Existing conditions, No-Build conditions and the Proposed Action conditions on I-25.

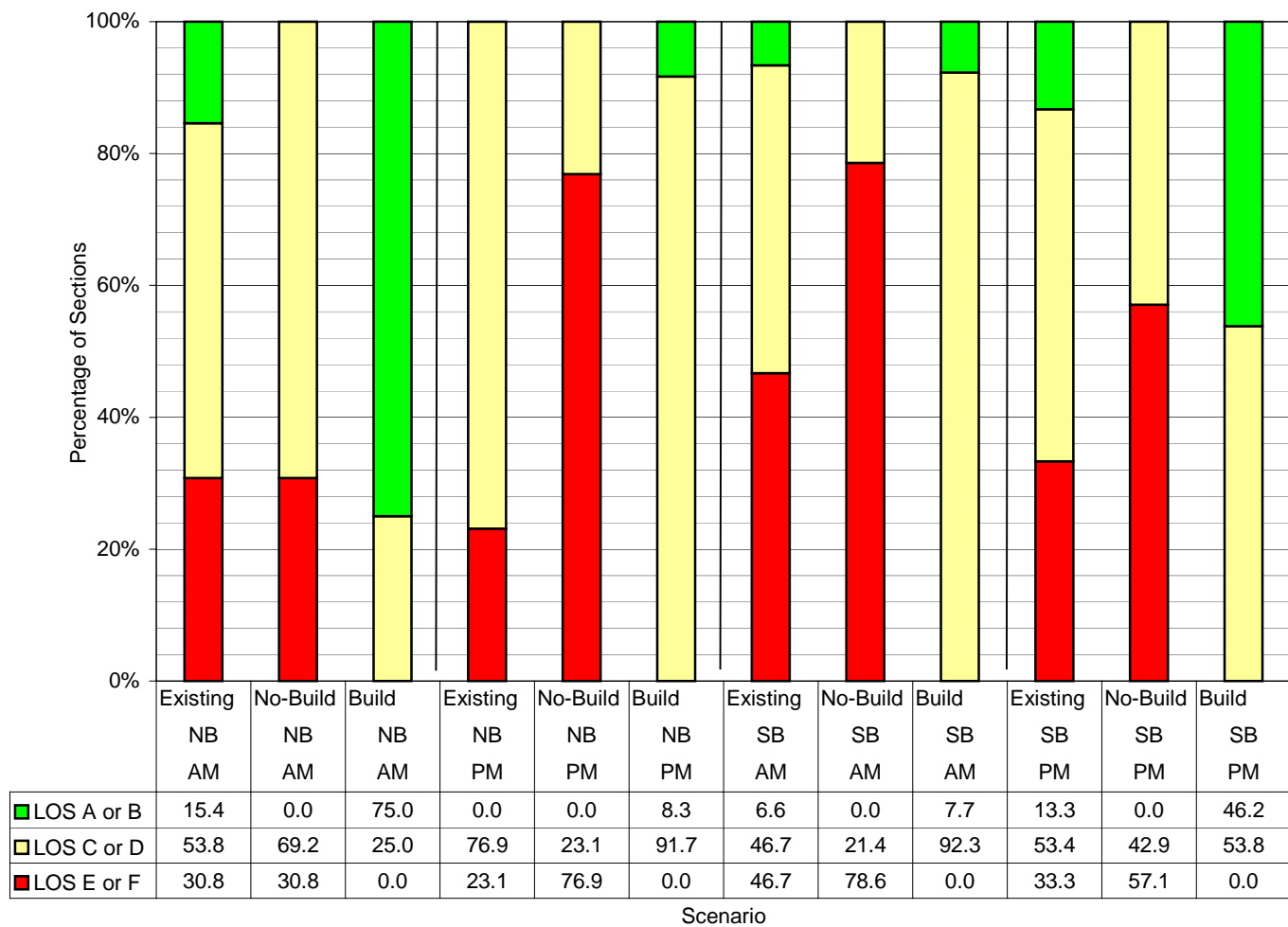


FIGURE 10
Comparison of LOS for Scenarios for All Basic Freeway Segments on Interstate 25

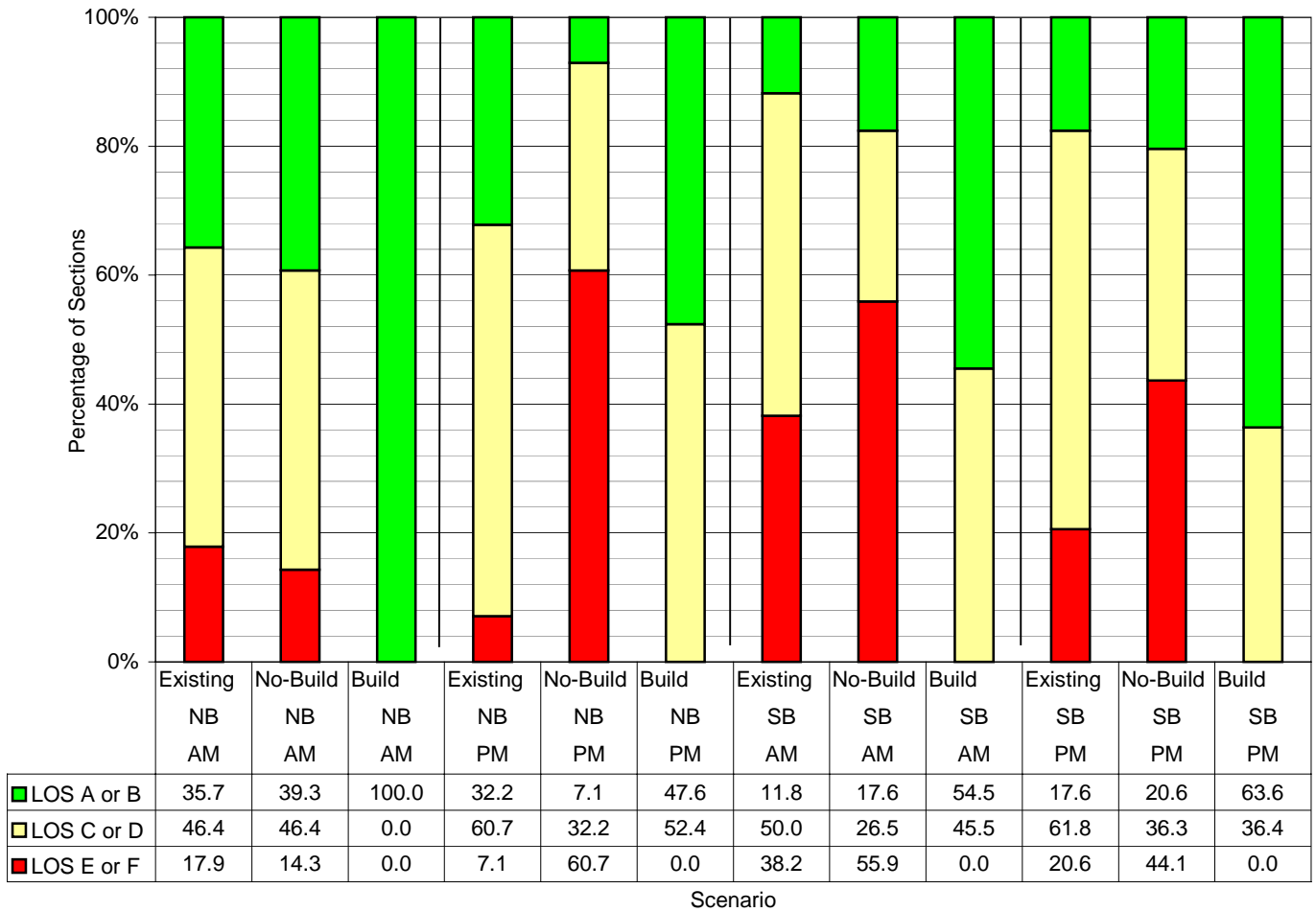


FIGURE 11
Comparison of LOS for Scenarios for All Ramp Junctions (Merge and Diverge) on Interstate 25

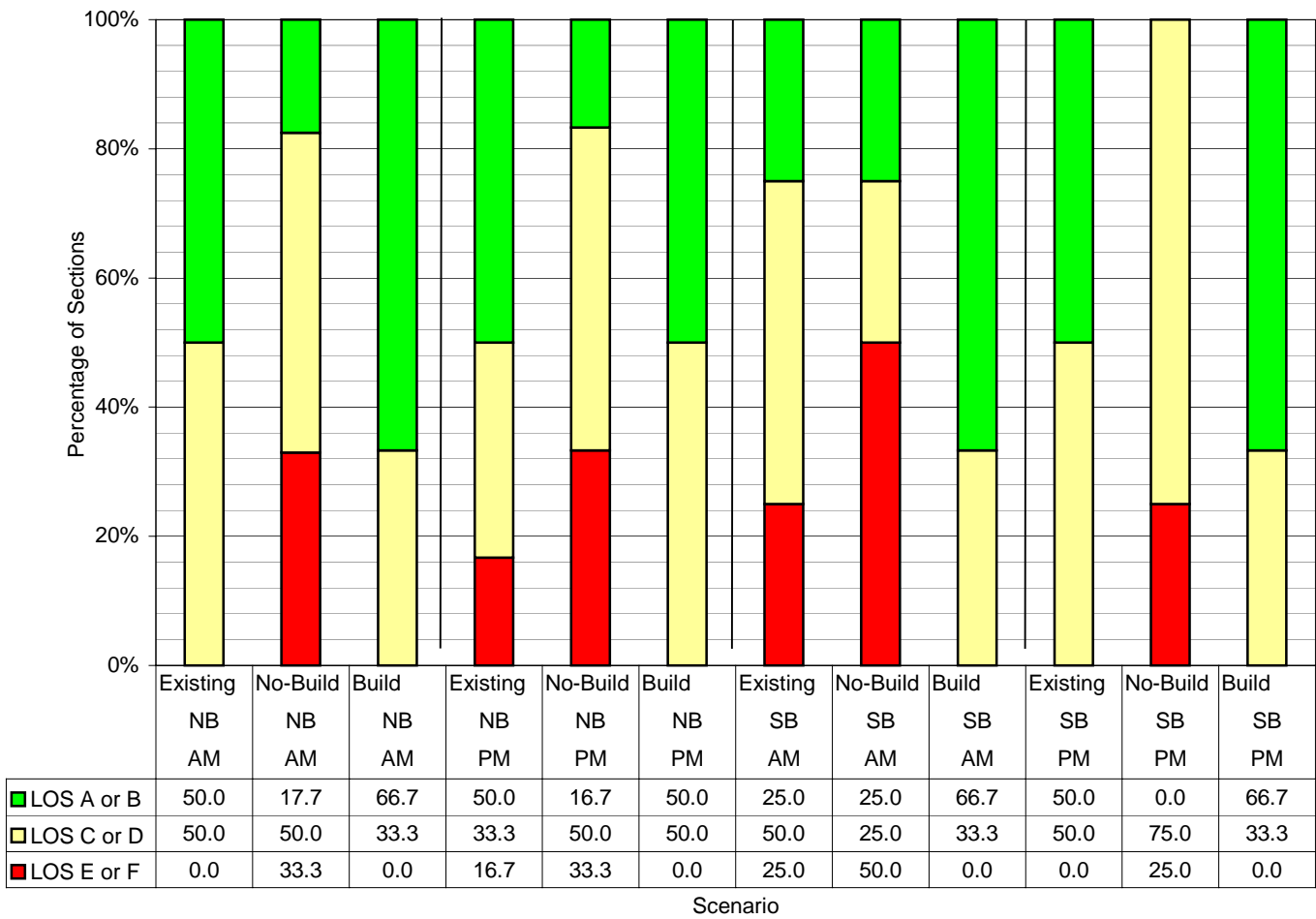


FIGURE 12
Comparison of LOS for Scenarios for All Weaving Sections on Interstate 25

It can be observed from Figure 10 that, for each direction of each peak period, the operational condition of the basic freeway segments on I-25 worsens from the Existing to the No-Build condition. However, the proposed Build conditions improve the operational LOS of basic freeway segments considerably. For example, for I-25 North during the PM peak hour, Existing conditions estimates show the operational LOS to be predominantly C or D. The operational LOS for I-25 north during the PM peak hour changes to E or F for the No-Build conditions. If the proposed improvements for I-25 are completed, the Build conditions operational LOS would be better than the Existing conditions. Similar inferences can be drawn from Figure 11 for ramp junctions and Figure 12 for weaving segments on I-25.

In summary, the proposed access points/improvements to Interstate 25 does not have a significant adverse impact on the safety and operation of the facility. It can be inferred from Figures 11 and 12 that the improvements would significantly improve operations when compared to the Existing and No-Build conditions on Interstate 25 for current and future traffic.

5.2 2025 Build Volumes, Capacity Analysis, and LOS for Cross Roads

The 2000 HCM was used to evaluate the LOS for each signalized intersection at the ramp terminals from I-25. The HCS evaluation assumed that timings used for the Existing condition analysis could be modified for the Build condition to optimize the signals. The HCS LOS analysis for the cross road ramp terminals is shown in Table 13 – HCS LOS Analysis of the Interchange Ramp Terminals.

TABLE 13
HCS LOS Analysis of the Interchange Ramp Terminals for the Proposed Action

Interchange Intersection	Peak Hour	Signal Location	Original Cycle Length	Existing LOS	2025 No-Build	2025 Build
161- Monument	am	West	90	C	C	C
		East	95	C	E	C
		Center	93	C	C	B
	pm	West	90	C	D	D
		East	95	D	F	D
		Center	93	C	F	C
153- Interquest Pkwy	am	w/ 83	80	C	D	D
	pm	w/ 83	80	B	C	C
151- Briargate Pkwy	am	w/ 83	105	C	E	F
	pm	w/ 83	105	C	E	E
150- N. Academy	am	East	69	A	A	B
		West	69	A	B	B
	pm	East	138	A	B	B
		West	138	A	B	B
149- Woodmen	am	East	124	F	D	E
		West	124	F	B	D
	pm	East	124	F	E	D
		West	124	F	B	C
146- Garden of the Gods	am	Center	137	D	D	D
	pm	Center	137	C	F	F

TABLE 13

HCS LOS Analysis of the Interchange Ramp Terminals for the Proposed Action

Interchange Intersection	Peak Hour	Signal Location	Original Cycle Length	Existing LOS	2025 No-Build	2025 Build
145- Fillmore	am	East	132	C	D	C
		West	132	D	F	--
	pm	East	132	C	F	D
		West	132	F	F	--
144- Fontanero	am	East	n/a :90	--	B	B
		West	n/a :90	--	A	A
	pm	East	n/a :90	--	B	C
		West	n/a :90	--	C	D
143- Uintah	am	East	114	C	C	C
		West	114	C	C	D
	pm	East	114	B	B	C
		West	114	B	C	C
140- Nevada/Tejon	am	Tejon North	--	A	C	D
		Tejon South	115	C	D	D
		Nevada North	115	C	C	C
		Nevada South	115	F	B	C
	pm	Tejon North	--	A	C	E
		Tejon South	115	C	C	C
		Nevada North	115	B	C	C
		Nevada South	115	F	C	F
138- Circle/Lake	am	East	125	B	B	B
		West	125	C	C	C
	pm	East	125	B	C	C
		West	125	C	D	D
135- S. Academy	am	West	100	B	B	B
		East	100	B	B	C
	pm	West	100	C	E	E
		East	100	B	D	C

- The **Monument/State Highway 105** ramp terminals operate at an acceptable LOS in both peak hours. Geometric improvements to the interchange contribute to the improved LOS.
- The **Interquest Parkway** ramps intersect State Highway 83 about ¾-mile east of I-25. The intersection operates at LOS D in the AM peak hour and LOS C during the PM peak hour (the same as both No-Build peak hours).
- The **Briargate Parkway** ramps intersect State Highway 83 north of Colorado Springs. The intersection operates at LOS F during the AM peak hour and LOS E during the PM peak hours. The AM peak hour shows a deterioration of LOS compared to the No-Build condition. Traffic that was diverted away from this interchange for the No-Build condition is present and contributes to the decreased LOS.
- The **North Academy** ramp terminals currently operate well at LOS B during both the AM and PM peak hours.

- The **Woodmen Road** interchange ramp terminals operate close to capacity (LOS E) in the AM peak hour and LOS B during the PM peak hour. The intersections in the Build condition operate at a worse LOS than the No-Build condition because of the increased demand on the intersections as a result of the improved LOS on I-25. Traffic that was diverted away from the intersections because of congestion on I-25 is now present in the Build condition and contributes to the decreased LOS.
- The **Garden of the Gods** interchange is a single-point urban interchange with one center signalized intersection. Similar to the No-Build condition, the intersection operates at LOS D in the AM peak hour and LOS F in the PM peak hour. The failing LOS is mainly caused by the heavy eastbound through movements and westbound on ramp volumes. The heavy northbound left turn onto Garden of the Gods Road also contributes to the poor LOS.
- The **Fontanero Street** ramp terminals operate well in both the AM and PM peak hours. The east ramp operates at LOS B in both peak hours and the west ramp operates at LOS A in the AM and LOS C in the PM (the same as the No-Build condition).
- The **Uintah Street** ramp terminals currently operate well at LOS C/D during the AM peak hour and LOS C for the PM peak hour with little change over the No-Build condition. Increased demand at the intersections is attributable to the improved LOS in the I-25 corridor. Traffic that was diverted from the intersections is now present because of the reduced congestion on I-25. The increased demand lowers the LOS in the Build condition versus the No-Build condition.
- The **Nevada Avenue/Tejon Street** ramp terminals operate at a reduced LOS compared to the No-Action Alternative. As stated before, the increased demand at the intersections is attributable to the improved LOS in the I-25 corridor. Traffic that was diverted from the intersections is now present because of the reduced congestion on I-25. The ramp terminals operate at an acceptable LOS in the AM peak hour (LOS C/D). The Tejon north and Nevada south intersection operate at capacity in the PM peak hour primarily because of heavy northbound Nevada through traffic and heavy eastbound traffic coming from Tejon and the I-25 off ramp.
- The **Martin Luther King Jr. US 24 Bypass** does not have ramp terminals with signalized intersections. The ramps merge to the east to become a bypass highway (Fountain Road).
- The **Circle Drive/Lake Avenue** ramp terminals operate well during both peak periods at LOS B/C for the east ramp and LOS C/D for the west ramp. During the PM peak hour, the operations of these signals are generally worse than the Existing condition.
- The **South Academy** ramp terminals currently operate well at LOS B/C during the AM peak hour with little change from the No-Action Alternative. During the PM peak hour the east signal operates at LOS C, which is better than the No-Action Alternative, and the west signal operates at LOS E (the same as the No-Action Alternative).

6.0 Indirect Impacts of Proposed Action

The improvements to the interstate facility serve to enhance the LOS of the entire network of interstate and arterials in the corridor. Under the Proposed Action, growth areas to the north provides an efficient system of travel to and from the downtown core from the growth areas in the north without overloading the internal, off-interstate, roadway system. However, because the interstate facility operates at a higher LOS than the No-Action Alternative, the east-west arterials will see heavier volumes. As the interstate facility is improved, the desire to use the facility returns, and the arterials used to access the interstate will see an increase in volume over the No-Action Alternative.

Specifically, the roads that will see some return traffic (traffic originally diverted because of heavy congestion in the interstate corridor) are arterials such as Woodmen Road, Garden of the Gods Road, and North Academy Boulevard that have access to other north-south arterials parallel to the interstate corridor.

7.0 Mitigation

The Interstate 25 capacity improvements will have a beneficial impact upon regional mobility, and especially for north-south travel in the Interstate 25 corridor. It is not necessary to mitigate this beneficial impact, but it is important to ensure that the freeway will function efficiently.

The Proposed Action includes the region's first proposed high-occupancy vehicle lanes, intended to encourage the use of buses and carpools as alternatives to single-occupant vehicle use. Existing freeway incident management infrastructure (e.g., video surveillance and variable message signs) will be maintained. Additionally, freeway on ramps will be designed to accommodate freeway ramp-metering systems that may be used in the future to ensure smooth weaving onto the highway.

The Proposed Action is appropriately reflected in modeling for the PPACG's regional transportation plan (Destination 2025), and thus its localized and systemwide transportation impacts have already been considered in terms of prioritizing related improvements to the regional street network.